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## Railroad Combinations and Public Policy.

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[From advance sheets of a volume entitled "Railroads: Their Origin and Problems," soon to be published by G. P. Putnam's Sons, New York.]

After describing the various combinations and attempts at combination made by the trunk lines to avoid carrying the through traffic without profit, Mr. Adams says:

The combinations which have been described are representative. Capital is trying to protect itself, and will succeed in doing it. The stress of competition has been too great, and in its own way is resulting in combination. It is not necessary to multiply examples. If it were they could be found in any direction, for during the last two years there is almost no section of the country or branch of trade which has not been "pooled." They are based upon the same fundamental principles; whether a division of business, or a division of the money receipts from business. They are directed to the same end, the control of competition. They differ only in details. The effect of these combinations and their evident tendency to development remain to be considered.

It is, of course, unnecessary to say that all combinations of the character of those which have been described are looked upon with much popular distrust, and are held to be against well-established considerations of public policy. In the minds of the great majority, and not without reason, the idea of any industrial combination is closely connected with that of monopoly, and monopoly with extortion. In view of this fact, it is very pertinently asked, Why should a railroad combination, avowedly intended to hold competition in check, if not to put an end to it, produce any result other than the natural and obvious one of raising prices? Who or what is to protect the community against the extortions of these great corporations, should they cease to quarrel and compete among themselves? In the first place, conceding all its evils and objectionable features—its inherent wastefulness, its harsh inequities—its violent fluctuations—the question still remains an open one, whether competition, as it has hitherto existed, is not after all, at least for America, the best and the final solution of the railroad problem. If, indeed, from this point of view, any railroad problem can be said to exist. The considerations which lead to the conclusion that it may be, have been very clearly stated in a recent public document.

[Here Mr. Adams makes the quotation from the "First Annual Report on the Internal Commerce of the United States," by Joseph Nimmo, Jr., quoted under the head of "The Pooling Combination of 1877" in the last report of the Massachusetts Railroad Commission, and copied in the *Railroad Gazette* of Jan. 25 last, page 38.]

The opening and closing considerations presented in this extract are somewhat at variance. A combination which will be equal to the difficult task of preventing "the occurrence of those sudden changes of rates which cause erratic diversions of traffic," and which would yet not be "sufficiently powerful to control all the transportation lines of the country"—such a combination as this would be one difficult at least to devise. That the law of competition where it can have full play is a most beneficent one in its operations, few would care to deny. As respects the railroad system, however, the whole problem happens to be embraced in the question: Can this law from the nature of the case there find full scope for its operations? If it can, there is an end of the matter. There is then no problem at all to consider, for competition will settle the whole difficulty. But, on the other hand, does not competition in the case of the railroad system, necessarily, while working with excessive violence, work most unequally? In fine, is not discrimination, somewhere and against some one, the logical and inevitable result of every uncontrolled railroad competition? And is it not matter of experience, that the fiercer the competition grows the harsher the discrimination becomes? If this is so, can such results be classed as among the usual results of a "great beneficent law?" This is the whole question, if there is any question, and it will not do to beg it. That "the weakest line determines the rates," is true; but it would also seem, from the experience of the past, that it will continue to determine them only so long as the stronger line does not see its advantage in absorbing it through lease, consolidation, or purchase. A railroad war which does not end in a consolidation of lines, or in the absorption, through some process, of one line by another, is an indecisive war, and, judging by all recent experience, will almost inevitably be renewed, soon or late. That the absorption does not all take place at once, and that the combining process is not yet over, merely proves that all railroad, like other wars, are not decisive, and that great processes take time for their completion. So also it is true that the limits of local or non-competitive traffic are undergoing a steady contraction; but it is this very fact which has precipitated the recent destructive railroad wars. These, in their turn, have then rapidly led to schemes of combination between the trunk lines, while the smaller independent lines, exhausted by competition, have been forced to lose their identity in one or another of the contending systems. The consolidating and combining influences of the last ten years have, indeed, produced results not to be mistaken. There are, also, very significant indications that the railroad system of this country is now on the threshold of a most active and unprecedented development in that way. This subject, however, will more naturally be referred to in another connection. \* \* \*

Contrary to the general and popular conviction, an increasing number of those who have given most thought to the subject, whether as railroad officers or simply from the general economical and political points of view, are disposed to conclude that, so far from being necessarily against public policy, a properly regulated combination of railroad companies, for the avowed purpose of controlling competition, might prove a most useful public agency. These persons contend that railroad competition, if it has not already done its work, will have done it at a time now by no means remote. An enormous developing force, during the period of construction, its importance will be much less in the later periods of more stable adjustment. Under these circumstances, and recognizing the fact that the period of organization is now succeeding that of construction, these persons are disposed to see in regulated combination the surest, if not, indeed, the only way of reaching a system in which the advantages of railroad competition may, so far as possible, be secured; and its abuses, such as waste, discrimination, instability, and bankruptcy, be greatly modified, if not wholly gotten rid of. In conducting its traffic, they argue, each road or combination of roads is now a law unto itself. It may work in con-

cert with other roads or combinations, or it may refuse to do so. It may make rates to one place, where it may think it for its interest that business should go, and may refuse to make them to another place where it is for its interest that business should not go. All this is essentially wrong. Yet the business community of America, from one end of the country to the other, has been from the beginning so thoroughly accustomed to the extreme instabilities of railroad competition, that it has wholly lost sight of what its own interest requires. What it needs is certainly—a stable economy in transportation—something that can be reckoned on in all business calculations—a fixed quantity in the problem. This, of all results the most desirable, is now even looked upon with apprehension. There is an idea, the result of long habit, in the public mind, that, so far as transportation is concerned, prosperity is to be secured through a succession of temporary local advantages—an unending cutting of rates. The idea of a great system of internal transportation at once reasonable, equitable, and certain—permitting traffic to flow and interchanges to be made just how and where the interests of buyer and seller dictate—never discriminating—rarely, and then only slowly, fluctuating—this is a conception very far removed from the reality, and it may well be doubted whether now it even commends itself when stated to the average man of business. He clings, on the contrary, to the burden of inequalities to which he is accustomed, and is inclined to doubt whether he could live without them. It is as if a mariner had become so habituated to a constant succession of squalls and simoons, that he questioned whether it would be possible to satisfactorily navigate a ship in trade-winds; especially if the trade-winds blew for all. Accordingly, equal rates, no matter how reasonable, the moment they are applied are looked upon by the favored points of competition, like Chicago or New York, as in some way an outrage. These points have become so accustomed to discrimination against others and in their own favor that they regard it as a species of vested interest. Their boards of trade call upon their legislatures to secure it to them. They have even gone further than this, and presented the somewhat ludicrous spectacle of modern communities claiming that their own want of enterprise and wasteful methods of doing business should be prevented from bringing forth their legitimate results through an unending railroad war. So possessed are they, indeed, with this idea, that it may safely be predicted that the principle of absolute freedom and strict impartiality in the management of the railroad system of America as a whole will only be reached as a result of long discussion and in the face of strenuous resistance. Meanwhile, until it can be reached, those composing the business public, as well as the stockholding class, must reconcile themselves as best they can to frequent repetitions on an increasing scale of those wild fluctuations and ruinous discriminations which have just been described in detail in the account of the railroad complications since 1873. Nothing of the sort exists in any other portion of the world.

If, however, any approach is ever to be made toward that ideal state of affairs which has just been suggested, it can apparently be made only in one way. The abuses incident to unhealthy railroad competition must cease; and undoubtedly the first step toward getting rid of those abuses is to render the railroad system, throughout all its parts, amenable to some healthy control. The present competitive chaos must be reduced into something like obedience to law. Yet this apparently can only be effected when the system is changed into one orderly, confederated whole. To attempt to bring it about during an epoch of wars, and local pools, and conflicts for traffic, would be as futile as it would have been to enact a code of laws, unsupported by force, for the government of the Scotch Highland clans in the sixteenth century, or a parcel of native African tribes now. A confederation, or even a general combination among all the railroad corporations having some degree of binding force, might, therefore, as has been suggested, not improbably prove the first step in the direction of a better and more stable order of things. But to lead to any results at once permanent and good this confederation must, in three respects, differ radically from everything of the same sort which has hitherto preceded it; it must be legal; it must be public; it must be responsible.

Tried by this standard, it is safe to say that none of the combinations now existing are consistent either with sound views of public policy, or have in them the elements of permanence. They are, in the first place, secret combinations of quasi public agencies; in the next place, as respects the ends they have in view and the means they use to attain those ends, they are amenable to no law; and, finally, they are all in greater or less degree irresponsible even to public opinion. They fail, moreover, even to accomplish the one result which, if practically brought about, might justify their existence—they do not afford to the community a reasonable and equitable system of charges for carriage, permitting an unchecked flow of travel and commerce, the continuation of which may with safety be calculated upon. A local and makeshift character is apparent in them all, and is not ignored even by those who are parties to them. Indeed, every disturbing element which has heretofore broken up other combinations is latent in those now existing; the individuality of organization, the distinct separation of traffic, the armies of local freight agents, the extending of connections. While the processes of pooling are going on and during the very periods of truce, there is not a single considerable line in any one of the combinations which is not always anxiously looking about to strengthen itself in case of an ever-expected renewal of war. Under these circumstances, they will probably last only so long as the recollection of recent losses and the costly pressure of the last railroad war is fresh in the minds of stockholders and officials. Indeed, it is safe to say that the greatest of all these combinations, that of the trunk lines, is held together only by the personal influence and force of character of one man—its Commissioner, Colonel Fink.

The difficulties which stand in the way of any permanent organization of a beneficial character can, moreover, hardly be exaggerated. They are indeed so numerous and so great that it is regarded as little short of visionary to suggest that they can ever be overcome. In the first place there is no one legally authorized to enforce the peace between the high contracting parties. Each reserves the right to construe any agreement to suit itself, and in the last resort to refuse obedience to the decision of any one. There is no court of common arbitrament with the sheriff's officer behind it. Without this, all railroad combinations in this country, where a division of territory is impracticable, will prove but temporary. Even were they, under certain conditions, practicable, they are now rendered more than precarious, owing to the fact that the whole complicated system under which through or competitive railroad business is done is curiously vicious and extravagant, and must be radically reformed as a preliminary to any final settlement. It now implies the presence of a vast army of subordinates, whose very existence depends on that not being done, which those controlling the lines which feed them are continually trying to do. To realize the truth of this fact, it is but necessary for any person to walk down the leading business streets of any considerable town in the country. He will see that a great number of expensive

offices bear the signs of railroad and of car and dispatch companies, and at them tickets can be purchased and rates of freight made which are binding on all the connecting lines. The rents, salaries and perquisites of the army of retainers who occupy these offices come out of the railroad corporations, and the interests of the retainers and the corporations are exactly antagonistic—the first are always working to bring about railroad wars, in which business with them is brisk, while the last are always striving to effect combinations.

But beyond and behind all this, however, the railroad corporations of the United States have from the beginning enjoyed a sort of lawless independence. Corporations, like communities, accustomed to this, necessarily remain for a long time restive under any sense of control. They need constantly to feel that a policeman's eye is upon them, and that there is a station-house in the next street. No one or two great corporations have yet been developed with power sufficient to assume a coercive protectorate over the others and to compel obedience. The combination of the trunk lines and their recent action toward their connections in the West is the first approach yet made toward this result. But without the cohesive influence of some such protectorate there is in all voluntary combinations a natural tendency to anarchy. In the absence, therefore, of any compelling force to secure order and subordination, the mill of competition has got to keep on grinding for some time yet. Its work is not done. Indeed it will not be done until, through the process of its grinding, the great principle of the survival of the fittest is finally ground out.

This process is unlikely to prove a rapid one, for order is not easily established in any community which has been long in a state of anarchy. In such cases the demoralization becomes general; the tone of the individual deteriorates. This is what is now the matter with the railroad system in America. Lawlessness and violence among themselves, the continual effort of each member to protect itself and to secure the advantage over others, have, as they usually do, bred a general spirit of distrust, bad faith and cunning, until railroad officials have become hardly better than a race of horse-jockeys on a large scale. There are notable individual exceptions to this statement, but, taken as a whole, the tone among them is indisputably low. There is none of that steady confidence in each other, that easy good faith, that *esprit de corps*, upon which alone system and order can rest. On the contrary, the leading idea in the mind of the active railroad agent is that some one is always cheating him, or that he is never getting his share in something. If he enters into an agreement, his life is passed in watching the other parties to it, lest by some cunning device they keep it in form and break it in spirit. Peace is with him always a condition of semi-warfare; while honor for its own sake and good faith apart from self-interest are, in a business point of view, symptoms of youth and defective education. Under such circumstances, what is there but force upon which to build? It was the absence of the element of force which caused the failure of the Saratoga association, and probably will cause the failure of those which have succeeded it. Taken as a whole, the American railroad system is in much the same condition as Mexico and Spain are politically. In each case a Caesar or a Napoleon is necessary. When, however, the time is ripe and the man comes, the course of affairs can even now be foreshadowed; for it is always pretty much the same. Instead of the wretched condition of chronic semi-warfare which now exists, there will be one decisive struggle, in which, from the beginning to the end, the fighting will be forced. There will be no patched-up truces, made only to be broken, for the object of that struggle will be the complete ruin of some one in the shortest possible time. Then will come the combination of a few who will be sufficiently powerful to restrain the many. The result, expressed in few words, would be a railroad federation under a protectorate. The united action of the great through lines is necessary to bring this about; and how to secure that action is now the problem. If the elder Vanderbilt were alive and in the full possession of his powers he probably would solve the difficulty in the way most natural to him. Meanwhile, although Commodore Vanderbilt is dead, there are very significant indications that his work is going on. His vast property, in the peculiar shape in which he left it and as it is now handled, seems to be little else than an accumulating fund devoted to bringing about a consolidation of railroad interests on the largest possible scale. The New York Central is the basis upon which this superstructure rests. The Vanderbilt interest in the property is so great that practically the earnings of this road, instead of being dissipated among innumerable stockholders, as is the case with the other trunk lines, are continually applied to securing the control of other and connecting lines—first, the Lake Shore, then the Canada Southern, then the Michigan Central. Scarcely during the last few years has one of these connections been absorbed before rumor has announced that operations have been begun upon another. The Erie, the Atlantic & Great Western and the Wabash are supposed to be the next in order. The precedent established by the father in buying up the Hudson River road in one lump in order to put a stop to its competition with the Harlem, is apparently being followed on a larger scale by the son.

While this is going on in the East under the Vanderbilt lead, two other and precisely similar "one-man" combinations are assuming shape—the one in the central region of the country west of the Missouri, and the other on the Pacific slope. They, also, are built upon the principle of devoting the earnings to the development of the business, and not to the support of stockholders. Accordingly competition does not now exist within the sphere of influence of these combinations, and its existence is rapidly becoming impossible; for, as soon as it makes itself felt, the competing line is bought out of the way. In this way the Union Pacific combination now controls seven corporations owning and operating 3,000 miles of track in the heart of the continent—an absolutely controlling interest—while on the western coast the Central Pacific occupies an even more commanding position.

In presence of such a policy as is common to all these interests, backed by such resources, the "fighting" superintendant finds his proper level. His day is over. The period of indecisive railroad wars is drawing to a close. The development in these cases is moreover made with ready money; that is, the earnings of the combinations are continually accumulated in the business. There is no topping superstructure of debt. Those earnings aggregate millions a year. In view of these facts there would seem to be some ground for supposing, as was suggested in another connection, that the railroad system of this country is now on the threshold of a most active and unprecedented consolidating development, and that the question of the survival of the fittest among railroads may here be decided at a less remote day than is usually supposed.

But, however this may be, it is a question of the future and certainly has no immediate bearing on the existing combinations. Of these the only one which seems entitled to any thoughtful consideration is the Southern Railroad and Steamship Association. So far as the public is concerned, everything essential as a safeguard against abuse seems in the case of that association to be provided. It is a complete, but not a secret combination. It exists in the full light of



publicity. The purposes for which it was organized are openly avowed, and its every transaction is, or may easily be made, matter of general observation. To secure this result it would only be necessary to give it legal recognition. By its originators it is confidently claimed that, if properly developed and recognized by legislation, it would afford a complete and practical solution of the American railroad problem. Whether it would or no, it is certainly a great advance on any other form of solution which has yet been suggested. It is at once far more philosophical, more practical, and more in consonance with American political usages and modes of thought. Indeed, it is not easy to point out any respect in which it might not fairly be accepted as the natural and logical outgrowth of American railroad development, as it has gone on up to this time. The difficulty with all of the many other solutions which have from time to time been suggested has been that they disregarded what had gone before; they were none of them in the nature of a logical sequence or natural outgrowth. Those who originated them sought to deal with a vast and complicated system as if it were so much plastic material, to be handled and shaped at will. Both the scheme for the State ownership of railroads, and the measures of Granger legislation failed and were abandoned, for this reason, they were not sequences; and while the first could not stand the test of discussion, the last broke down in practice. The idea of regulating all railroads through the State ownership of one—the Belgian system—was some years ago brought forward, and urged on legislative attention by the Massachusetts Commission as at least worthy of careful inquiry. Subsequently it was examined into more carefully in connection with a Massachusetts enterprise in which the State already held a controlling interest, and the practical difficulties and objections, both political and financial, which presented themselves were of such a nature that those engaged in the investigation, although one of them was a member of the Commission and as such committed to the theory, unanimously found themselves compelled "by the logic of their investigations, regardless of preconceived theories," to another result.

Irresponsible and secret combinations among railroads always have existed, and, so long as the railroad system continues as it now is, they unquestionably always will exist. No law can make two corporations, any more than two individuals, actively undersell each other in any market if they do not wish to do so. But they can only cease doing so by agreeing in public or in private on a price, below which neither will sell. If they cannot do this publicly, they will assuredly do it secretly. This is what, with alternations of conflict, the railroad companies always have done in one way or another; and this is what they are now doing and must always continue to do, until a complete change of conditions is brought about. Against this practice, the moment it begins to assume any character of responsibility or permanence, statutes innumerable have been aimed, and clauses strictly interdicting it have of late been incorporated into several State constitutions. The experience of the last few years, if it has proved nothing else, has conclusively demonstrated how utterly impotent and futile such enactments and provisions necessarily are. Starting, then, from this point—accepting what is and what must continue to be—the fundamental idea of the Southern Railroad and Steamship Association is to legalize a practice which the law cannot prevent, and, by so doing to enable the railroads to confederate themselves in a manner which shall be at once both public and responsible. This is the railroad side of the question. The other side of the question—that of the public—admits of a statement equally clear. Its essential point, however, is that, through this process, and this process only, can the railroad system as an organized whole be brought face to face with any public and controlling force, whether of law or public opinion. Once let the railroad companies confederate in accordance with law, and the process through which this all-important confronting result would be brought about is apparent. The confederation would be a responsible one, with power to enforce its own decisions upon its own members. The principles upon which it could act, as a creature of the law, would be formulated in the law. It could compel obedience, but obedience only to legal decrees, and the question in each case would be whether the decree was legal. At exactly this point the machinery for State supervision would come into play in the form of a special tribunal; like those which have already been provided in England and France, or that now being matured in the Prussian parliament. The field of discussion before this tribunal would be commensurate with the whole subject of transportation by rail, including questions not only of law but of economy. Then, at last, the correct principles governing railroad traffic would be in course of rapid development. The essential features of what constitutes discrimination and extortion would gradually be formulated into rules, and the moment that is accomplished competition will work equitably. This result must follow. It must follow, from the fact that competition is now almost entirely local. That is, a competitive rate to or from one point, in no way necessarily affects rates to or from other points—a local variation does not cause the whole schedule to move up or down. This is what makes discrimination. Could the system be confederated and equalized, however, such would not be the case. An established tariff, intended to be public and permanent, would then have to be fixed upon, just as it is to-day fixed upon in each of the local pools which have been described. This tariff, however, would, of necessity, fluctuate throughout under the pressure of competition at any one point. For instance, a lake rate to be met at Chicago would affect the land rate from Louisville; if it did not, one point would be discriminated against, as it now perpetually is, in favor of the other. In like manner a river rate from St. Louis would affect the land rate from Chicago. Thus the principle of the all-pervading action of competition would be generally established through a confederation, as it is locally established through combinations to-day. In this way, full effect would be given to that natural and healthy competition which is now so successfully repressed. Discrimination being thus disposed of, it would then only remain to guard against extortion. That would not, apparently, be difficult. In the first place, it would probably be found that the effect of natural competition would, once the play of its forces was made all-pervading, afford the necessary protection. If it did not, the extortion would have to be practiced openly, and by a responsible agent upon whom the whole force of public opinion might and would be directed. Should this fail to produce the desired effect, the central agency being responsible to the law as well as to public opinion, recourse could finally be had to legislation. Beyond this, it does not seem worth while at present to carry the discussion. The first step is, necessarily, to accustom the public mind to the idea that railroad combinations possibly may be an evil only because they are unrecognized, and that the proper way to deal with them may, perhaps, be through regulation and not through prohibition.

In pursuing the discussion, however, care must be taken lest the argument against competition is carried too far, or is not properly understood. It will not do to rush from one extreme to the other. The natural question which has already been suggested must be clearly borne in mind: Why should a railroad combination, avowedly intended to

hold competition in check, if not to put an end to it, produce any result other than the natural and obvious one of raising prices? Who or what is to protect the community against the extortions of these great corporations, should they cease to quarrel and compete among themselves? And, in the first place, it must be frankly acknowledged that the argument against railroad competition can only be advanced subject to great limitations. Undoubtedly the fierce struggles between rival corporations which marked the history of railroad development, both here and in England, were very prominent factors in the work of forcing the systems of the two countries up to their present degree of efficiency. Railroad competition has been a great educator for railroad men. It has not only taught them how much they could do, but also how very cheaply they could do it. Under the strong stimulus of rivalry they have done not only what they declared were impossibilities, but what they really believed to be such. None the less, extraordinary as these results have been, they have been reached only at an excessive cost; a cost so excessive as to show clearly that the process is one which cannot be continued indefinitely. Under the incessant strain of competition the number of competitors is being steadily reduced. The present question, therefore, is not whether good results have ever been secured through railroad competition, but whether the same or even better results may not now be secured through other and less costly processes. During the last forty years the railroad system has grown, and experience has grown with it. During that time, also, competition has, to a degree, expended its force, and is now obviously working its way out to a final result. If that result is to be a legalized confederation it must be borne clearly in mind that, while railroad competition would cease, the influence of every other form of competition—sea, lake, river and canal—would, through the machinery of that confederacy, be economized and extended to its utmost possible limit. If the confederacy were touched by competition at one point, it would feel it at all points. Throughout, its rates would rise and fall together. Thus if one form of competition should cease, another would be prodigiously quickened.

But allowing even the monopoly to become complete, and having only such forms and degrees of restraint as law, usage, public sentiment and self-interest can supply, we are by no means without analogous cases having a very close bearing on the argument. In our cities, for instance, as regards the supply of gas, it is found cheaper and better for the community to have to do with one company than with several. So also as respects the supply of water. In this country it is now usual for cities and towns to construct their own water works. If this, however, were not the case, few would be disposed to deny that a city having to do with a single aqueduct company would be apt to have a much more satisfactory service than one which sought to divide it among many. Carrying now the argument directly into the case of railroads, and having recourse again to experience, we find that railroad competition has been tried all over the world, and that everywhere, consciously or unconsciously, but with one consent, it is slowly but surely being abandoned. In its place the principle of responsible and regulated monopoly is asserting itself. The same process, varied only by the differing economical, social and political habits and modes of thought of the people, is going on in France, in Belgium, in Germany and in Great Britain. The experience of the three first-named countries bears much less strongly than that of England on the particular conditions existing in America, yet even for us their experience is not without its significance. In France we see six great corporations dividing the country into as many distinct territories, and each of the six directly responsible for the territory served by it; while both these corporations and the government view with undisguised apprehension the recent appearance of a competing, though subsidiary, system. In Prussia, a plan of close government supervision through a special cabinet officer, a member of the ministry, is now being matured, while elsewhere in Germany the lines are rapidly passing into the hands of the governments, or under their more immediate control. Apart, however, from this, the German experience in one respect deserves peculiar notice. The local and governmental subdivisions of Germany, more than those of any other country of Europe, resemble our federated system of States. Placed in the centre of Europe, Germany is a species of thoroughfare, while at the same time the individual members of its railroad system belong under different jurisdictions. Here, then, every condition is found which is likely to incite an uncontrolled railroad competition. To a degree it existed, at one period, but the German temper and habits of thought are so different from the American that competition there speedily resulted in combination. The German Railroad Union, including as it does nearly one hundred different managements, operating twenty-six thousand miles of track, actually accomplishes many of the results which the Saratoga and Atlanta combinations were designed to accomplish.\* It makes all necessary arrangements respecting joint traffic, settles questions of fares and freight, and substitutes arbitration for wars of rates. It has to a certain degree introduced uniformity and stability into the system. The fact that such an association is easily formed in Germany, and is formed only with the greatest difficulty in America, proves nothing except the powerful influence of national thought and temper. A certain amount of waste and confusion sufficed to bring a system into being in the one case; the present question is, how much more waste and how much greater degree of confusion will be necessary to bring a somewhat similar system into being in the other case?

In Belgium alone has railroad competition proved a permanent advantage; and it has proved so there for the simple reason that the competition between railroads in Belgium, unlike that in the United States, was never uncontrolled. A hand was always on the regulator. The Government, as the largest owner of railroads, was itself the chief competitor, and as such its action was certain, equitable, and justly distributed. It could not show preferences, or discriminate, or make good the losses sustained in fighting over a divided business out of profits exported from an exclusive business. Regulated in this way, competition could be kept alive and made beneficial. It did not wear itself out by its own excesses.

Of all foreign experiences, however, that of England most resembles our own. The only essential difference is that England is wealthier and infinitely more compact than the United States, so that, as respects railroads, causes produced their results much more quickly there than here. Nowhere, however, is the present tendency toward the concentration of railroad interests in a few hands more apparent than in England. The mill of competition has there about fulfilled its allotted work. The whole English railway system has now passed into the hands of a few great companies, by whom the country is practically divided into separate districts. These are literally in the hands of monopolies. The practical result of this consolidation, as compared with the old-fashioned competition, was set forth in two concrete cases by the parliamentary committee on railway amalgamation of

1872, in language which has already been quoted, but which in this connection will bear repetition.

The Northeastern Railway "is composed of thirty-seven lines, several of which formerly competed with each other. Before their amalgamation they had, generally speaking, high rates and fares, and low dividends. The system is now the most complete monopoly in the United Kingdom; from the Tyne to the Humber, with one local exception, it has the country to itself, and it has the lowest fares and the highest dividends of any large English railway. It has had little or no litigation with other companies. While complaints have been heard from Lancashire and Yorkshire, where there are so-called competing lines, no witness has appeared to complain of the Northeastern; and the general feeling in the district it serves appears favorable to its management."

There is scarcely a section of the United States which could not tell of an experience very like the English one just referred to. Massachusetts, for instance, could supply a well-known case in point. Of two sections of that State lying north and south of the city of Boston, the one known as the Cape Ann and the other as the Cape Cod district, the first has from the beginning been served by two rival lines whose whole history has been one long trial of strength, resulting at last in the absolute ruin of one and in the severe crippling of the other. How many millions of dollars were recklessly squandered in the long course of the struggle, it is impossible to compute. While the Cape Ann district has thus enjoyed the benefits of railroad competition, the southern or Cape Cod district has, on the other hand, been served by a single consolidated corporation, the cardinal principle with which has been monopoly. It appropriated to itself a certain district, and that district it undertook to furnish with all reasonable railroad facilities; but within the limits of its own territory it did not propose to tolerate any rival. The result in these two cases, whether in accordance with theory or not, is confirmatory of experience. Between its two rival corporations the northern district was through years converted into a battle-ground, and turned up-side down; rates fluctuated wildly and varied everywhere; common tariffs were made and not observed, and profits were pooled; bits of connecting road were seized hold of by the one combatant or the other, and were perverted from serving the community into being engines of attack or defence. As to the two companies, with that impenetrable stupidity which usually characterizes the lover of petty independence, they sturdily preferred to lose thousands in conflict rather than incur the risk of being over-reached in negotiation by so much as a dollar. Each of them absolutely threw away enough money to buy up the other in that stupid fighting in which thick-headed presidents and "smart" superintendents uniformly delight. The one meant "to get even with the other," and both were resolved, no matter how much it cost, to have its "share of the business." Between them they ruined the business, dissatisfied every one, and then—came to terms with each other. Meanwhile, in the southeastern section of the State peace certainly prevailed, if not absolute contentment. As respects railroads this last it is not well to expect, and, if expected, it will not be found. Nevertheless it is certainly true that, according to general experience, the nearest approach to it is reached, not only abroad but here, through the course pursued in this case. The reliance on competition seems to give throughout a false direction to public opinion as respects railroads. They are looked upon as something alien, if not hostile. The public welfare is associated in the popular mind with their misfortunes. On the other hand the intelligent and peaceful operation of a consolidated company is generally followed by a sense of responsibility on the one side, and of ultimate friendliness on the other.

Besides the economical arguments which are so difficult to be overcome in this discussion, there are certain other objections to any such solution of the railroad problem as that suggested, which cannot be ignored. They have at least a strong hold on the popular ear and mind. In their character they are political or sentimental. As respects those of the first description, it is certainly not too much to say that jealousy of great corporations is a cardinal article in American political faith. There is reason for it, too; and in this respect recent scandals have given to railroad corporations a peculiar and unpleasant prominence. Neither is this instinctive jealousy confined to America. It is only a very few years since the present Sir Henry Tyler in one of the reports of the Board of Trade of Great Britain, formulated the proposition that the time was at hand when "the State must control the railroads, or else the railroads would control the State." Yet when the parliamentary committee on amalgamations considered this question in 1872, they were obliged to report that the "growth of the corporations had not brought with it the evils generally anticipated." The fact is that in this, as in so many other instances, the truth of Mr. Disraeli's aphorism, that "in politics, it is the unexpected which is apt to occur," received fresh illustration. In this country, as well as in Great Britain, these wise people who so earnestly point out the dangers incident to railroad concentration wholly ignore the important practical fact that concentration not only brings with it a corresponding increase of jealousy, but also an equally increased sense of responsibility. It is not the few great corporations which are politically dangerous, but the many log-rolling little ones. No one who has had experience in dealing before a legislative body with questions affecting railroad interests has failed to realize this fact. The burden of responsibility—almost of popular odium—which the large corporation bears, the ease with which a senseless cry can be raised against it, is even, as compared with smaller corporations, out of all proportion to its increased strength. So much has been written and declaimed on this subject, however, that it is well to be as distinct as possible in dealing with it. The popular apprehension of imaginary dangers to be apprehended from railroad consolidation is not well considered. With those who have most reflected on the subject, it is safe to say that the idea of a combination of all the railroad interests of the country into the hands of three or four corporations—even though they might practically be the creatures of a triumvirate's will—would excite no apprehension. That corporation, or those who composed that triumvirate, would retain power only by most carefully abstaining from all abuse of power. Little as those who expatiate on the subject seem to realize it, it is nevertheless true that with each new railroad the Vanderbilt, or the Jay Gould, or the Huntington interest acquires, the more cautious and conservative they become. They realize the responsibilities and dangers of their position if their critics do not. The only present difficulty is that those who undertake to represent the community neither understand the situation, nor know how to take advantage of it.

Finally, it remains to consider the sentimental objections. The combination of railroads, it is claimed, is un-republican—through it the dynasty of the "railroad kings is insidiously asserting itself. This argument is of the kind which sets refutation at defiance. Not infrequently it is met with in the columns of the press, but it is an argument appropriately addressed only to that discouragingly large class among whom words are money and not counters. If it unmitigated cant, and deserves only to be treated as such. There is a principle much

\* We believe that the German Railroad Union does not deal with rates and competition at all; but there are smaller combinations or Verbände of railroads in the Union which do, and apparently exist solely or chiefly for that purpose.—EDITOR RAILROAD GAZETTE.

† Report from Select Committee on Railway Companies Amalgamation (1872), page xxvii.



nearer the foundation of republican institutions than any jealousy or apprehension of railroad kings—the great principle of not unnecessarily meddling. After all, men and systems can best develop themselves in their own way, and it is hardly worth while either to continually prognosticate evil or to pass one's life in fighting shadows.

Briefly reviewing the whole ground which has now been traversed, it is obvious that the tendency of events and drift of discussion are everywhere the same—away from a reliance on the beneficial effect to be derived from the uncontrolled competition between railroads. In America only does any considerable body of reflecting persons continue to have faith in it. In France and in Belgium the principle never was recognized, and the later tendency is distinct and strong against its admission. In Great Britain, where it originated, it is now definitely abandoned. In Germany the highest authorities incline toward the idea of a confederation of railroads directly confronting the Imperial Government and responsible to it. The movement, however, seems to have its limits, and those tolerably well defined. The idea of State-ownership can hardly be said to be growing. On the contrary, in those countries like France and Germany, where recourse would naturally be had to this solution of the problem, the tendency seems now rather to be toward a close regulation of the railroads by the government, without its owning them; while in other countries, where the institutions are of a more popular character, a system of public supervision is assuming shape. This supervision would seem to be the limit of development on the one side, and regulation on the other.

Owing to the extremely complicated character of the American railroad system, rendering anything like a territorial division among corporations impossible, results here work their way out slowly. When they do work their way out, however, it is apt to be on a large scale and in a way not easily susceptible of change. So far as any progress has yet been made, it is obviously in the direction indicated—the development of government supervision on the one side, and the concentration of railroads to escape competition on the other. The manner, indeed, in which, starting from different standpoints of interest and opposite sections of the country, the Massachusetts Commission and the Southern Railroad and Steamship Association have unconsciously worked toward a common ground is noticeable. On the one hand the whole effort of the Commission has been to develop a tribunal which, in all questions affecting the relations of the railroad system to the community, should secure publicity and that correct understanding of the principles upon which only legislation of any permanent value can be based, and which is reached through intelligent public investigation. That secured, all else might safely be left to take its own course. A sufficient responsibility would be secured to afford a guarantee against abuse. On the other hand, the fundamental idea of the association, without the realization of which it remains incomplete, is to so confederate the railroad system that the members of it should be amenable to control and that responsibility should attach to it. Could the two results be brought about, the machinery would be complete. The confederated railroad system would confront the government tribunal, and be directly responsible to public opinion. This is almost precisely the result arrived at in France and in Great Britain, and is that contemplated in Germany.

It would be altogether premature to predict with any confidence that this or a similar result will speedily be reached in this country. Judging by experience, it is more probable that the development on the side of the railroad system will far outstrip that on the side of the government. The popular disbelief in the possibility of any permanent combination of the railroads, at once general and effective, is so complete that no provision will be made for it. Should one be brought about, it will, however, in all probability, once it assumes shape, assume it very rapidly. In that case no great degree of public injury would necessarily be sustained, but the difficulty of thereafter restoring the necessary equilibrium would be materially increased. Another and more persistent political movement of the Granger character might and probably would become a necessity. As opposed, however, to an overshadowing commercial interest, so concentrated that all eyes and passions could be brought to bear upon it, this is not likely to be a movement difficult to originate or easy to resist.

#### Commissions.

Attention has been called of late in various ways to a practice which seems to have become too general in the commercial world, of agents and other intermediaries levying blackmail in the form of commissions, received from persons with whom they have to transact business for their principals. It is impossible to determine with accuracy to what extent this practice obtains, but there is reason to fear that it is very widespread. Additions to the cost of purchases, and the consequent increase of price to consumers in an extraordinary degree, are not the most pernicious results. The tone of commercial morality is weakened and lowered, and men are encouraged to proceed from one degree of guilt to another. Without a spirit of strict integrity and honor, mercantile enterprise is sure to decay. It therefore behooves us to maintain a high and uncompromising standard. As commonly practised, the giving and the receipt of a commission are nothing less than a bribe, and both parties to the secret compact are deserving of stern reprobation. It is not to be supposed that a man can accept a commission from another with whom he is transacting business for a third party, and yet retain a judgment perfectly unbiased, so as to protect his employer's interests. He may not knowingly betray his principal, although he may come to do that in time; but at the very outset his independence and honesty will be surrendered, and he will accept terms less favorable than might have been made. In this case his employer is sure to suffer; while if he takes the bribe and does nothing for it, clever casuistry is required to show why he should put into his pocket unearned money. Its very acceptance involves a breach of trust, even though it could be shown that no bias has thereby been given.

A recent decision in the Court of Queen's Bench, in the case of *Harrington v. the Victoria Graving Dock Company*, opportunely shows that the practice is so illegal and immoral in the opinion of the Judges that they decline to enforce a contract said to be made under such circumstances. The plaintiff, it appears, was consulted by the Great Eastern Company about the repairs of two of their ships. Under his advice, a contract for the repairs was accepted from the Victoria Graving Dock Company, and the plaintiff undertook further to see that this was duly carried out. But there was a private agreement between the plaintiff and the dock company of which the Great Eastern Company knew nothing. The plaintiff was to receive a commission of 5 per cent. from the dock company on the amount paid for the repairs. This money was to be given to him in some part for obtaining the contract for the dock company, and in some part, it was urged, for his subsequent trouble in superintendence. The total sum due to the plaintiff under this concealed agreement was upwards of a thousand pounds, the greater part of which he had received in due course. The action he brought against the dock company was for an unpaid balance of about £800. The

case was a good deal complicated by what had happened in the meanwhile since the secret agreement had been entered into. The Great Eastern Company discovered the facts; and so, too, had the directors of the dock company, by whose manager the arrangement had been made. It is with this latter part of the story that we are now concerned. The directors of the dock company at once repudiated the contract of their manager with the plaintiff, and refused to complete it, as being illegal. The jury before whom the plaintiff's case came found that the contract had a tendency to bias the mind of the plaintiff, and to prevent him from doing justice to his original employers, but that he had not, in point of fact, been biased by it. Whether on this finding the contract could be upheld was the chief question which came before the Queen's Bench Judges. Their decision was clear and unanimous. They treated the promised commission as a bribe intended to corrupt the agent in contravention of his duty to his employers. What had or had not been its effect was a point they declined to enter into. It was enough that such a bargain had been made and had been kept secret. It was corrupt on the very face of it, and was opposed not only to strict law, but to morality. Whether, as the jury had held, it was possible to touch pitch of this kind without being defiled by it, the Judges refused to consider. It was pitch of a very dirty sort, and the hands that had meddled with it were not likely to be of the cleanest. The tendency of the bargain before the Court was, the Lord Chief Justice declared, to lead the agent to be disloyal and unfaithful to his employer. It does not matter whether the employer has been in fact damaged. It is enough that it was intended to be injurious to him; that is a corrupt object, and it vitiates the contract. If any doubt existed before, it has been laid at rest by this decision. The practice of receiving commissions has been declared illegal, and in terms which should make it impossible in future for any man to suppose that he can do so honestly. Such an emphatic statement of the law of the case is of the highest importance, for many a man will do an act which he knows to be not quite honorable, and will yet shrink from what the common voice of mankind has pronounced to be downright dishonesty. There is no room left now for subterfuge in the matter of commissions. They are dishonorable, and they are dishonest, too, and those who give them and those who take them must expect to be judged accordingly.—*Capital and Labor.*

#### Report of the Secretary of the Master Mechanics' Association.

The following report was presented at the last convention: GENTLEMEN OF THE CONVENTION: I herewith submit for your information a detailed statement of the business of my office for the Association year, ending May 13, 1878.

At date of last report the Association numbered 198 members; since that time nine members have resigned and 12 have joined the Association, and in accordance with Article 4 of Section 4 of our constitution, the names of 24 members now two years in arrears for annual dues will hereafter be stricken from the rolls: With these changes the Association will number 176 members.

By order of the Supervisory Committee the Secretary obtained a proposition that was deemed fair, and the contract for printing 1,500 copies of the report of the proceedings of our last annual meeting was awarded to Wiltach, Baldwin & Co., of Cincinnati, at 70 cents per copy, or a total of \$1,050.

The total number of reports distributed by sale and otherwise during the year is 875, as follows: 777 of the tenth, 9 each of the eighth and ninth, 8 each of the first and second, fifth, sixth and seventh, 5 of the third and 4 of the fourth; also 39 miscellaneous reports sold by the *Railroad Gazette*, the total number sold being 136.

As several voluntary contributions have been received every year from locomotive works and others interested, to pay the expense of printing and distributing our annual reports, it was determined by the Supervisory Committee to issue a circular to the railroad companies represented, that they and others who might feel an interest in the prosperity of the Association might have an opportunity to contribute something to its support. Accordingly, the following circular was decided upon as one best calculated to secure the desired object:

"DEAR SIR: The American Railway Master Mechanics' Association, organized in the year 1868 for the purpose of an interchange of views of those having the immediate management of the mechanical department of the different railways in the United States and Canada, as to the materials, form, proportions, and manner of construction to be used and observed in the design, building, maintaining, and operating the machinery under their charge, have met in annual convention from year to year, to the present time, printing and giving to the public the results of the protracted and patient labor of the various committees appointed from time to time to investigate the more important matters pertaining to the safe and economical use and management of railway machinery, and in our annual reports we have compiled the results of tests and experiments made by different persons in the use of various devices which we deemed of importance, as a means of information to those in charge of railway machinery, who, under other circumstances, might spend time and money in experiments which had been made and facts fully established previously by others.

"The labor necessary in collecting these facts, making tests and experiments, compiling the reports and preparing them for publication, has been given by the members of the Association at such times as they could spare from their ordinary every-day duties, without any pecuniary remuneration whatever, and the expense incurred in printing and distributing the circulars and annual reports has been borne by the members individually, and the reports have been distributed to all railway officials desiring them, free of cost.

"The object of the work of the Association is solely to devise and establish greater perfection and economy in the mechanical department of our railways, and whatever has, or may yet result from these efforts, the railways interests of the country receive the benefit therefrom.

"In view of this fact we respectfully ask the consideration of the managers of the different railways represented in our Association, and those taking an interest in its efforts to promote knowledge beneficial to the interests committed to their charge, upon the question as to whether it would not be just and proper that their companies bear a part of the expense incident to the publication and distribution of the annual reports. If the members give their spare time to investigation and to compiling reports and pay their personal expenses connected therewith, we think it not asking too much of the companies to pay the cost of printing and distributing the annual report, which, on a basis of the number of roads represented in the Association, will require twelve dollars from each road, and each will be furnished with as many copies of the annual report as they desire for distribution to general officers.

"If the above suggestion is favorably considered by you, and your company is willing to pay to the Supervisory Committee of the Association the sum above named, please indi-

cate to them that fact, by letter or otherwise, to the Secretary, who is authorized to receive and receipt for all moneys so contributed.

N. E. CHAPMAN,  
REUBEN WELLS,  
J. N. LAUDER,  
S. J. HAYES,  
J. H. SETCHEL,  
Supervisory Committee."

I am very happy to report the exceedingly kind and favorable manner in which this circular has been received by those who have responded, and the good will that in every case has attended the contribution. Where the donation has been declined, poverty and hard times has been the reason assigned, but in no case has an unwillingness been expressed on the plea that the Association was unworthy of support. All who have contributed have done so cheerfully, and many of the replies, if written out, would show the members that our labors are more highly esteemed than some of us are disposed to believe. Although but about one-half of the roads written to have responded, yet these will make their contributions yearly, and it is believed that more will be added another year. A large number of the Eastern roads pay all the expenses of their master mechanics, and some of these members have not been willing to present the matter to their superior officers. The Secretary will venture the suggestion that if the back dues of members, which are \$820, were all paid up, the assessment could be reduced to five dollars per year hereafter.

The following is a complete list of the railroad and locomotive companies contributing to the printing fund. If any omission is noted the Secretary will thank the members to call attention to the fact in open convention, as a number of roads have promised the contribution whose remittances have not yet been received. I presume the proper time for payment has not arrived:

Lehigh Valley	\$12.00
Mineral Range	12.00
Terre Haute & Indianapolis	12.00
Connecticut River	12.00
Philadelphia, Wilmington & Baltimore	12.00
Delaware, Lackawanna & Western	12.00
St. Louis & Iron Mountain	12.00
Northern of New Hampshire	12.00
Concord	12.00
Louisville & Nashville	12.00
Canden & Atlantic	12.00
Maine Central	12.00
Texas & Pacific	12.00
Cairo & Vincennes	12.00
Burlington, Cedar Rapids & Northern	12.00
Boston, Lowell & Nashua	12.00
St. Louis & Southeastern	12.00
Cumberland Valley	12.00
Detroit & Milwaukee	12.00
Delaware & Hudson Canal Co.	12.00
Cleveland, Tuscarawas Valley & Wheeling	12.00
Missouri River, Ft. Scott & Gulf	12.00
Chesapeake & Ohio	12.00
Cleveland & Pittsburgh	12.00
Missouri Pacific	12.00
Kansas Pacific	12.00
Pittsburgh, Fort Wayne & Chicago	12.00
Boston, Barre & Gardner & Monadnock	12.00
Illinois Central	12.00
Grand Trunk	12.00
Wilmington & Weldon	12.00
Cleveland, Columbus, Cincinnati & Indianapolis	12.00
Canada Southern	12.00
Atlantic & Great Western	12.00
Erie	12.00
Lake Shore & Michigan Southern	12.00
North Pennsylvania	12.00
Pennsylvania	12.00
Chicago, St. Louis & New Orleans	12.00
Toledo, Peoria & Warsaw	12.00
Northern Pacific	12.00
Atchison & Nebraska	12.00
Jacksonville, Pensacola & Mobile	12.00
Mobile & Ohio	12.00
Raleigh & Augusta Air Line	12.00
Indianapolis, Bloomington & Western	12.00
Western & Atlantic	12.00
Houston & Texas Central	12.00
Pittsburgh, Cincinnati & St. Louis, Little Miami Division	12.00
Second and Third Divisions	12.00
Pennsylvania Co., Jeffersonville, Madison & Indianapolis	12.00
Schenectady Locomotive Works	12.00
Brooks	12.00
Baldwin	12.00
Porter, Bell & Co.	12.00
Total amount contributed to printing fund	\$900.00
" " received by assessment	1,530.00
" " initiation	12.00
" " sale of reports	139.07
Cash from <i>Railroad Gazette</i> for use of manuscript	50.00
Donation from Buffalo Steam Gauge Co.	50.00
Walton W. Evans	10.00

Total receipts for the year \$2,451.07  
Amount on hand at last report 51.94

Making the total amount to be accounted for \$2,503.01

Disbursements:	
Secretary's salary	600.00
Reporter's bill—St. Louis	77.75
Rent of hall	55.00
Bill of John Hewitt—St. Louis	3.50
Cincinnati Safe Deposit Co.	15.00
Annual Postage Bill	70.16
Dues of A. Mitchell—remitter Treasurer	10.00
Paid Wiltach Baldwin & Co., amount due at last report	373.85
Paid Wiltach Baldwin & Co. bill for Committee Circulars	51.25
Paid Wiltach Baldwin & Co. on bill for Tenth Annual Reports	457.25

\$1,713.70

Balance on hand at this report \$789.25

The Boston Fund, consisting of three \$1,000 bonds, for which we paid 3,615.00

Two \$100 bonds, for which we paid 231.50

Interest on three \$1,000 bonds, collected July, 1877 304.50

Interest on three \$1,000 bonds, collected January, 1878 91.35

Interest on two \$100 bonds, collected March, 1877 10.40

Interest on two \$100 bonds, collected March, 1878 10.00

Interest unapplied at Jan. 6, 1877, date when the two \$100 bonds were purchased 81.06

287.31

Amounts in all to \$4,133.81

—which amount represents the value of the original three thousand dollars. These bonds and the interest are deposited in a box in the vault of the Safe Deposit Co. at Cincinnati, rented for that special purpose as stated in my previous reports.

The Secretary, however, not being willing that the safety of this trust should rest upon his personal statement, has therefore requested and obtained a meeting of the General Supervisory Committee and other members of the Association, who have made a personal examination of the bonds, money and papers belonging to the Association, and have



made a statement of their approval, which I have attached to this report.

All of which is respectfully submitted,

J. H. SETCHEL, Secretary.

To the American Railway Master Mechanics' Association:

GENTLEMEN: We, the undersigned members, do hereby certify that we have made a personal examination of the condition of the bonds and moneys belonging to the Association, and we find the annexed report of the Secretary is a true and correct statement of the condition of the Boston Fund and other finances.

Respectfully,

N. E. CHAPMAN,  
JAMES SEDGLEY,  
W. F. TURREFF,  
JACOB JOHANN.

May 13, 1878.

ported to his office, Mr. Wheeler makes an entry in this book of the fact, and then sets about finding it, which, as will hereafter appear, he does in little less than no time. Each train baggage man is provided with a book which has duplicate pages—one marked original; this has columns—of station where received; initial checks; number of checks. When he gets into his car at the starting-point at either terminus, he must fill out these pages. One is taken out and at the end of his route or division is mailed to Mr. Wheeler. When he delivers a piece of baggage, he also makes a statement in duplicate, one of which is sent to Mr. Wheeler's office and the other kept by him. At each station the agent also makes a statement of what baggage he receives, which is also sent to the general office. When the train baggage man on the overland

is that which is left at stations uncalled for by the owners, or those articles left on the ferries and local trains referred to. Each week the agent and depot, on the line or boats, send to Mr. Wheeler's office such articles as are found or are unclaimed. He then seeks to discover the proper owner, and, failing, he sells them at auction in April of each year. The trunks are opened by Mr. Wheeler, and if any money, watches, jewelry, or valuable papers are found they are advertised, and if no owner appears they are handed over to the County or City Treasurer, to await ownership there. This is made obligatory upon him by law. At the last sale there were 160 parasols sold, a bushel of fans, a lot of overshoes, some old overcoats, a lot of old blankets, some boots and shoes, a few old hats, several valises, a lot of trunks, etc.—*San Francisco Evening Post*,

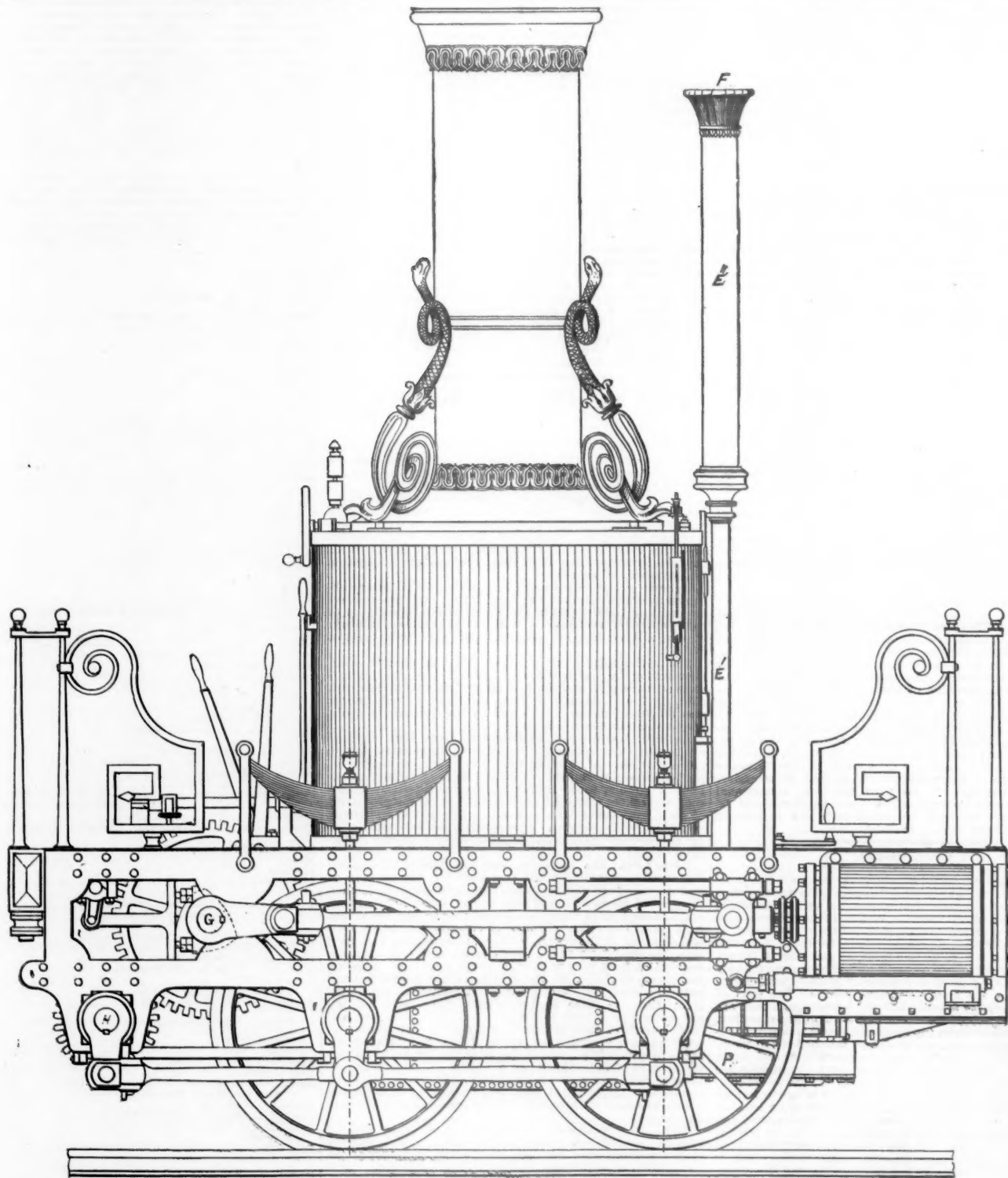


Fig. 1.  
"MUD DICGER" LOCOMOTIVE.

Built in 1838 by Gillingham & Winans, of Baltimore, for the Baltimore & Ohio Railroad.

#### The Central Pacific Baggage Department.

The Central Pacific Railroad Company have a baggage department, which is presided over by O. C. Wheeler, who is perhaps the most perfect in the details of his business of any baggage agent in the United States. Mr. Wheeler has been in this department nearly seven years, and gave the reporter much information in regard to the disposal of the lost and unclaimed baggage on the various lines controlled by this great corporation. Mr. Wheeler's predecessor in office said that some years ago this company paid from \$500 to \$700 per month for lost baggage. Now, however, the system is so perfect that nothing is paid except for baggage which is stolen, which is not frequently the case. The system which he has adopted is as follows: A large book is ruled with nineteen columns from left to right in the following order: Date called for; when the baggage was missing; kind of baggage; kind of check; number of check; where checked; when checked; where found; when found; when ordered; where delivered; whose fault; record of correspondence, and general remarks. When a piece of baggage is lost, and it is re-

ported to his office, Mr. Wheeler makes an entry in this book of the fact, and then sets about finding it, which, as will hereafter appear, he does in little less than no time. Each train baggage man is provided with a book which has duplicate pages—one marked original; this has columns—of station where received; initial checks; number of checks. When he gets into his car at the starting-point at either terminus, he must fill out these pages. One is taken out and at the end of his route or division is mailed to Mr. Wheeler. When he delivers a piece of baggage, he also makes a statement in duplicate, one of which is sent to Mr. Wheeler's office and the other kept by him. At each station the agent also makes a statement of what baggage he receives, which is also sent to the general office. When the train baggage man on the overland

#### "Mud-Digger" Locomotive.

In the *Railroad Gazette* of March 8, 1873, an engraving and description were published of the "Grasshopper" locomotive designed by Phineas Davis, of York, Pa., for the Baltimore & Ohio Railroad. Mr. Davis was killed on a trial trip of one of these engines. After his death a considerable number of them were built by Messrs. Gillingham & Winans, of Baltimore, for the Baltimore & Ohio and other roads. Two of these "Grasshopper" engines are, we believe, still in service; one of them it will be remembered was exhibited at the Centennial in Philadelphia.

The engine represented by the engravings herewith was the second stage of development of the "Grasshopper" type, and was designed, we believe, by the elder Mr. Winans and built by the firm already referred to in 1838. It will be seen that this second type of engine is a step in the process of development from the first "Grasshopper" condition



toward the present modern form of locomotive. In the first or "Grasshopper" type the cylinders were vertical and the motion was communicated to the cranks by a species of walking-beam or bell-crank. In the second type the cylinders are placed horizontally and the bell-cranks are discarded, the connection being made directly with a crank-shaft, *G*, fig. 1, which has a spur-wheel which gears into another wheel on the shaft *H*, which is connected by cranks and rods with similar cranks on the driving-wheel axles.

In the description of the "Grasshopper" engine, the arrangement for producing a draft in the chimney was illustrated. This consisted of a fan which was driven by the exhaust steam. The same shaft to which the steam fan was attached carried another fan, which created a current of air, which was delivered into the ash-pan, and thus produced the required draft. In the engine illustrated herewith a similar arrangement was used. In the end view, fig. 2, the cylinders and the fans are represented in section, and it will be seen that the exhaust steam escaped at *C*, *C'*, to the pipes *E*, *E'*, and from them into the chamber containing the fan *A*, *A'*, which was made to revolve by the escaping steam. On the same shaft, *b*, another fan, *B*, *B'*, was attached, which, by its revolution, produced a current of air which was conducted by a pipe *P*, fig. 1, to the ash-pan to blow the fire. The exhaust steam after driving the fan *A*, *A'* escaped through a series of small tubes contained in the chamber *D*, *D'*. These tubes were surrounded with the feed-water which was pumped into this chamber before entering the boiler. This arrangement therefore acted as a feed-water heater and also as a sort of surface condenser for the exhaust steam. After passing through the tubes the escaping steam entered the passages *F*, *F'*, and from them into the exhaust pipe *E*, *E'*, *E''*, and escaped into the open air at *F*.

This arrangement worked satisfactorily for many years, although of course not nearly so simple as an ordinary blast pipe. It would seem, however, to be admirably adapted to engines which are used where the noise of the exhaust steam and escaping sparks are specially annoying, as is the case on the elevated railroads in New York.

A number of engines of this kind were built for and used on the Baltimore & Ohio Railroad, but have, we believe, all gone into the scrap heap some years ago. Our engravings were made from a lithograph, for the use of which we are indebted to Mr. Wm. H. Purdy, of the Illinois Central Railroad, who was at one time employed on the Baltimore & Ohio road. The lithograph is printed on parchment and formed, we believe, part of the specifications of a patent granted to Mr. Winans.

These illustrations and descriptions are published because they have never, to our knowledge, appeared before in any book or journal, and unless rescued now, they will speedily pass into oblivion, and thus another link in the history of American locomotives will be lost. The engineers were known as "mud-diggers," which euphonious title we have also preserved.

## Contributions.

### Graphic Records.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Permit me to urge briefly that there really ought to be, on the part of our accountants, a more frequent use of the graphic system of presenting statements, particularly when they are comparisons, as of the business done during the months of successive years, or of any similar thing. If this method be once considered, and it ought to be, as of the same kind as the setting forth, by means of a drawing, of the notes and requirements of a written specification, then the real practicalness of the whole will become more apparent. In other words, if the graphic statement, on a piece of profile or cross-section paper, be regarded as a picture, as it may be, of the facts embodied in the mass of figures, then its utility may be more fully appreciated, and the relief afforded to the mind, in the effort to grasp the relations between the different statements, will be seen to be something more than a mere supposition or fancy.

Something of this sort was hinted at in my note upon "Automatic Records" (June 28), and a really striking illustration of the subject happened to follow in your columns, in Mr. Vose's solution of the "Train Problem." Of course the keeping of accounts in figures can never be dispensed with, however perfect the keeping of automatic or graphic

records may eventually become, for, if for no other reason, men would decline to pay a draft if presented upon the sole basis of such a picture, however useful that picture might be in showing the real nature and bearing of the transaction, out of which the draft might have grown.

A host of illustrations could be given of the truth of this general principle, all looking invariably to the clearest possible placing before the mind of the salient facts involved. Please note, as one of these, your own advertising columns with their scores of engravings each week. What better means of comparing clearly, and most accurately, can be found for say two or three simple forms of springs, or of the

strength of the alloy is shown by the vertical height of this point above a plane surface beneath. Thus, at a glance, the strength, and hence the chief value, of an interminable series of alloys can be noted, from the strength of pure copper, as shown at one corner of the triangle, to that of an alloy of copper and tin only, seen along one side of the triangle, and then to that of a triple alloy at some point within the triangular figure.

It is most certain, since facts of such widely different sorts can be usefully and clearly shown by the graphic method, that its use is capable of indefinite expansion, and that no further proof can be needed of its importance to every department of a business in which numerical statements have to be critically studied. B.

### The Advantage of Narrow Gauge.

CLEVELAND, Ohio, July 29, 1878.  
TO THE EDITOR OF THE RAILROAD GAZETTE:

I read with pleasure your article in your edition of the 26th on the Narrow-Gauge Convention. From your and my standpoint it is clear, as you say, that the real questions at issue between those who do and those who do not believe in the narrow-gauge system were not discussed at all. But from the standpoint of the convention it was a grand success. The convention was not called to throw light on any of the ten questions upon which you and most of your readers desire light. It was called by persons interested in borrowing money for narrow-gauge roads, most of whom are hopelessly bankrupt. One of the chief managers, a friend of mine, whose fortune has been sunk in a narrow-gauge enterprise, pithily stated the object in view. In answer to a question as to what were the chief advantages, he said capitalists would lend no money on the standard gauge. It was necessary to make them believe the expenses were so much lower that they could borrow on the narrow gauge. New York capitalist have been done out of over a million in the narrow gauge from Painesville to Youngstown, Ohio, nicknamed by the people the "Pewee road." It runs through an excellent country; ends at the finest harbor on Lake Erie. Yet the sworn statements of the Receiver in the office of the United States Court here show that it does not pay running expenses by about fifty thousand dollars a year, and a portion of its rolling stock has been seized for taxes. G. T. LEWIS.

[It will hardly do to conclude that the gauge of a road was wrong because it failed to pay. Railroads of all gauges fail and succeed, but their failure is usually chiefly due to the want of enough profitable traffic.—EDITOR OF THE RAILROAD GAZETTE.]

### Abolish the Pay Car.

CINCINNATI, O., July 23, 1878.  
TO THE EDITOR OF THE RAILROAD GAZETTE:

In your number of July 19, "J. H. M." gives a form of pay-ticket for facilitating payment of men by paymaster *en route*, thereby saving the time of the paymaster, train-men and pay train on the road. As a still further means of economy, I would suggest that the pay car stay at home, and that the same form of pay ticket be issued, certified to by the foreman or person whose duty it is to return time of men under him, these certificates to be

paid by the nearest agent, the agent to return them as cash. There are very few persons who could not be accommodated in this manner, and those could be easily reached by other means. A paymaster's train is certainly very ornamental, but its usefulness is questionable. R. K.

### The Time Between New York and Philadelphia by the "New Line."

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the notice of fast time between Philadelphia and New York, in your issue of July 12, you have made a slight error, which, in justice to the "New Line," should be corrected.

The fast train referred to leaves Philadelphia at 7:45 a. m., and arrives at New York at 9:50 a. m., or 9:45 Philadelphia time, making the time two hours, instead of two hours and five minutes, as stated in your article.

The train is run from Philadelphia to Jersey City, 87.4 miles, in 1 hour and 51 minutes.

Stops are made at Jenkintown, Trenton Junction, and at Bound Brook, to change engines.

July 25, 1878.

A READER.

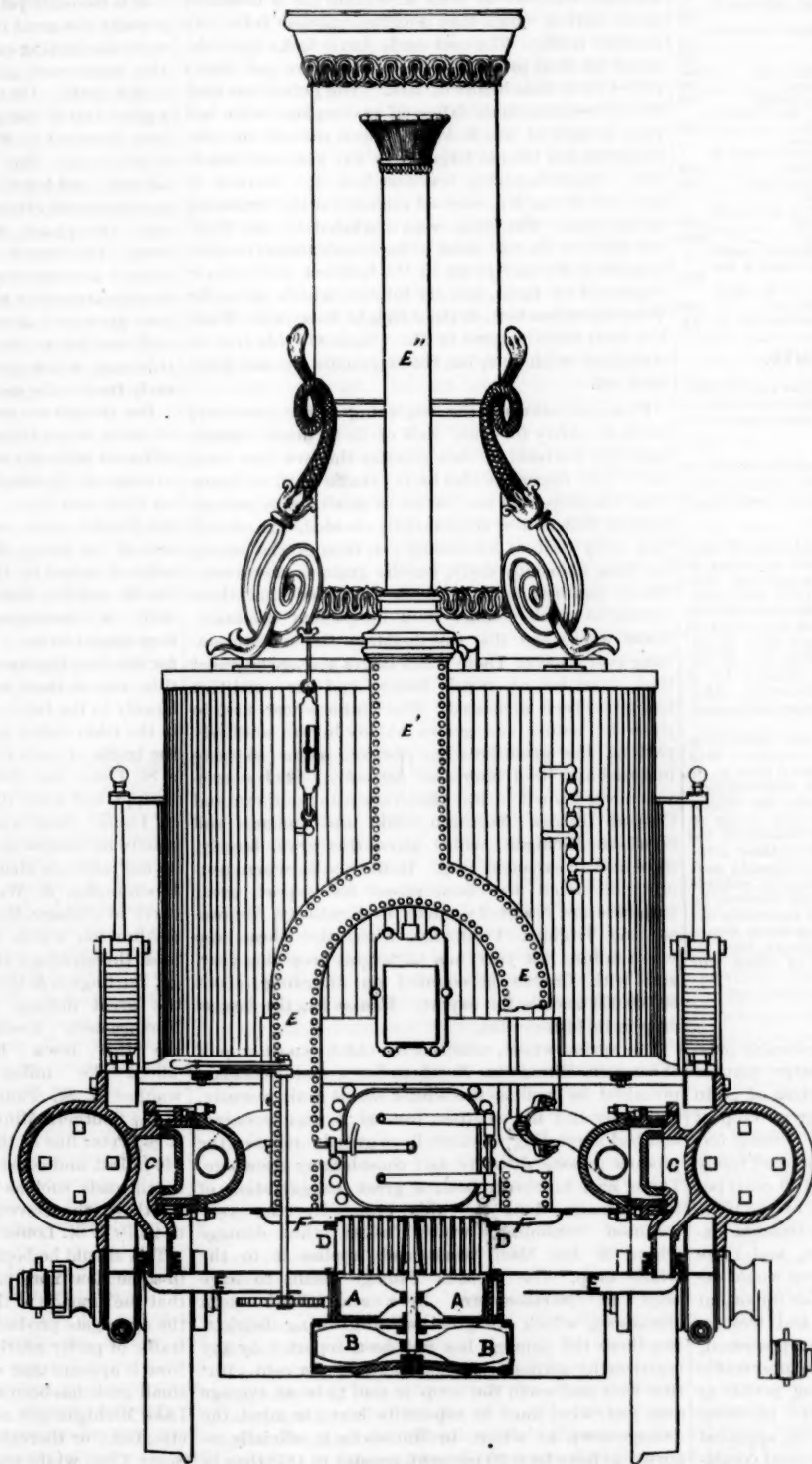


Fig. 2.

most complicated form of pin connection joint for a bridge truss, than to place drawings of them side by side, or, if some parts are identical, one directly on top of the other? Thus alone, as is known by every one concerned, can the essential differences be most clearly noted and studied, and, indeed, the more trifling the differences the more important does this placing of one upon the other become.

Your editorial columns have shown this employment of graphic charts or pictures very usefully (though the cuts were not of your best), and indeed it would seem as though every needful illustration and argument had been already employed to urge their use. Let me mention two others, however, that have been brought to public notice somewhat recently, each convincing of its kind, if there never had been any beside it. One is Mr. Latimer's chart of the condition and operations for 14 years of the Atlantic & Great Western Company, and the other Prof. R. H. Thurston's use of an undulating surface to represent the strengths of alloys of copper, tin and zinc. In this case the horizontal distances of any point in the surface from the three corners of an enclosing triangular outline represent the amount of these elements in any alloy, and the





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CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

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## EDITORIAL ANNOUNCEMENTS.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Addresses.**—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men, practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

## TRAFFIC PROSPECTS.

The year 1878 opened with unusually favorable prospects for railroad traffic and profits in a large part of the country. There had been a great harvest of grain in the upper Mississippi valley, and a great crop of cotton in the South. The grain had been coming forward rapidly for four or five months, and moved freely at profitable rates—on the basis of 35 and 40 cents per 100 lbs. from Chicago to New York most of the time, even while navigation was open. The petroleum exports for the past year had been enormous, and there seemed then no reason to suppose that they would decrease. The "hog crop," which supplies an important portion of the traffic of many northern and western roads, was turning out to be large without precedent, and, with the grain, was giving the largest winter traffic ever known. It was in favor of securing profits as well as traffic that the disposition toward harmony among the competing railroads had never appeared so strong before. A great number of formal combinations had been made for dividing traffic on agreed terms. Manufacturing industry was still greatly depressed, but the increase in production of raw materials and the good demand for them seemed to point to an early beginning of activity in this direction. The great coal roads did not seem likely to find much increase in the demand for their staple, but there was a fair prospect that they would make a greater profit on it than for the disastrous year previous.

The promise of the beginning of the year has been but partly fulfilled. The winter traffic was generally good—at least it was on most of the Northwestern roads, as far south as the Chicago, Burlington & Quincy road, and on the trunk lines, but the profits on the trunk lines were greatly reduced by their conflicts over the east-bound traffic; immense quantities of grain and provisions were forwarded in the winter months—much more than ever before in the history of railroads, and though at much less than regular rates, still doubtless there was a considerable profit from this traffic. But later in the season a very large propor-

tion of the traffic was spoiled by great reductions in the rates. A considerable part of the traffic between the Atlantic seaboard and the Mississippi, as far north as Burlington, Iowa, and everywhere east of Chicago, has been affected by the demoralization of through rates, which itself has been intensified by the opening of lake navigation a month earlier than usual. Still further west, the railroads of the Southwestern Rate Association, from Chicago and St. Louis to the Missouri River, as far south as Kansas City and as far north as St. Joseph, spoiled their through business in both directions for a month or more, during which they doubtless carried fully two months' traffic. The coal roads have had a light demand for their product, though they have got better prices for it than before of late. The petroleum traffic has unaccountably fallen off as compared with last year, in spite of much lower prices, though the consumption has been as large as in any year previous to 1877. Manufacturing business has not revived, at least not as much as seemed probable at the beginning of the year. The great crops marketed by the Western farmers do not seem to have made them free purchasers, if we may judge by the heaviest traffic staple consumed by them, namely lumber, which gives the Western railroads their chief freight westward. There has been some increase in the shipments this year as compared with last, but the shipments are not large after all.

Prognostications at the beginning of the year could be made safely for only half of it. So much depends upon the harvests in this country that we can form but a very imperfect idea of the traffic until we know what the crops will be. So far as small grains are concerned, this is now substantially decided. There will be a good deal of harvesting yet, though the season has been unusually early, but the grain is now everywhere matured, and so much harvested that there cannot be much change from its present condition. Some weeks ago this was doubtless the most promising ever known. There was a larger acreage of wheat than ever before—much larger—and its condition had never been surpassed. The winter wheat, first to ripen by nature and grown chiefly in the southerly part of the grain-growing district, seems to have matured and been harvested perfectly. Such a crop was never known in the Ohio valley, in Southern and Central Illinois. Northern Ohio and Indiana and Southern Michigan, which grow this grain largely, have also an excellent crop. In the South, where usually not much has been raised for export, great surpluses are reported—chiefly in Kentucky, Tennessee and Virginia. California, where the wheat crop was a failure last year, has its largest crop this year, and with Oregon is counted on affording about 30,000,000 bushels for export. Kansas has the largest crop in its history also.

The spring wheat, which is the chief export crop of Wisconsin, Minnesota, Northern Iowa and Nebraska, promised as well as the winter wheat until recently. But rainy and hot weather, just as it was ripening, and bad harvesting weather, have greatly reduced the produce in some districts and considerably elsewhere. There has, however, been a great exaggeration of the damage done to this crop, by the very common reasoning which takes the damage where it has been worst and applies it to the whole crop. The greatest damage seems to have been in Northeastern Iowa and Southeastern Minnesota, which are great wheat-growing districts. But there the damage has not been reported by any trustworthy authority at more than 30 per cent.; further west and north the crop is said to be an average one, and, what must be especially borne in mind, the acreage sown to wheat in Minnesota is officially reported to have been 30 per cent. greater in 1878 than in 1877. The most competent local authority estimates that the average yield per acre for the whole State is 17 per cent. less this year than last, and if that is true the quantity produced in that State even, where the damage has been greatest and most widespread, must be about 8 per cent. greater this year than last. It is true that the quality is poorer, and, being raised from a greater acreage, it must have cost the farmers more, so that at the same price even (which cannot be expected), the farmers would make smaller profits from this year's crop; but this will not affect the amount of traffic which it will afford.

In Iowa, as a whole, it appears that the increase in acreage will equal the decrease in average yield per acre (if there is any, which may not be the case in spite of a much smaller yield in the northwest part of the state). In Nebraska the crop seems to have been good, and the acreage much greater than before. The complaints from Wisconsin are comparatively few, but its acreage has not been very much larger, and even with an average crop it may have less wheat

than from last year's excellent crop. Illinois raises very little spring wheat, and the crop there is usually bad. Whether it is better or worse than usual this year will make very little difference in the total product of the country.

Taking the country as a whole, there is little doubt that it has the largest wheat product ever known. The increase in California alone will probably equal the damage to the spring wheat crop in Iowa and Minnesota, leaving the great increase in the winter wheat crop of the Ohio valley as net gain.

It is too early yet to speak confidently of corn, which is really the great crop of the country, though not always the leading export grain. There has not probably been a very great increase in the area cultivated in this grain. On the flat prairies of Illinois there was a good deal of complaint a few weeks ago that it had been drowned by wet weather and dwarfed by unseasonable cold. But corn is mostly made in July in that latitude, and hot weather in that month, with sufficient moisture, will often put a most unpromising field, if only the plants stand, in condition to bear a full crop. The month this year seems to have been decidedly favorable for corn. The same excessive heat and moisture that blighted the spring wheat made the corn grow as it alone can grow. But there is not yet sufficient information to judge of the probable yield of this crop, which has yet to encounter the danger of early frosts—the most deadly enemy of the corn crop.

But though we may have on the average a full crop of grain, as we fully expect a large crop of wheat, the different railroads will not be affected much by the average of the whole country, but chiefly by the crop on their own lines. For instance, the immense crop on the Pacific coast will hardly have any effect on this side of the Rocky Mountains except by reducing the price of wheat in the world's markets. The Central Pacific and the Southern Pacific railroads, however, will be immensely benefited by it, and we may expect to see a material increase of their earnings for the year beginning with July last, due chiefly to this crop, as there was a great decrease last year due largely to the failure of the crop. The excellent crop in the Ohio valley is likely to contribute materially to the traffic of such roads as the Pittsburgh, Cincinnati & St. Louis, the Baltimore & Ohio, the Ohio & Mississippi, and some Illinois roads which carry chiefly to St. Louis. Good winter wheat crops in Illinois (grown chiefly in Central and Southern Illinois) have an effect on the railroads about as far north as the Indianapolis, Bloomington & Western, including, of those which carry to Chicago, the Illinois Central and the Chicago & Alton (on which the danger to the corn crop was most threatening), and the St. Louis line of the Chicago, Burlington & Quincy. The roads most affected by the great damage to the spring wheat crop in Northeastern Iowa and Southeastern Minnesota are the Iowa lines of the Illinois Central (about 250 miles of them), the Chicago, Milwaukee & St. Paul (some 400 miles of it), the whole of the Southern Minnesota, about half of the Winona & St. Peter line of the Chicago & Northwestern (about 140 miles), and considerable sections of the north and south roads, such as the Burlington, Cedar Rapids & Northern, the Davenport & Northwestern, the Minneapolis & St. Louis, and the Iowa Central.

This should be borne in mind. From the comments in some New York papers one might think not only that the damage to the crops was sufficient to make the aggregate production unusually small, but that the traffic of pretty nearly all the roads would be affected. Now it appears that whatever damage there has been to small grain has been almost entirely west of Indiana and Lake Michigan and north of a line drawn from Lafayette, Ind., or thereabouts, west by north to Omaha or Sioux City; while the extreme western and northern part of this district even has suffered little. The local traffic of such roads as the Michigan Central and the Lake Shore & Michigan Southern seems not likely to suffer at all from this cause, and the lines as far south as the Indianapolis, Bloomington & Western hardly at all.

But though a large grain crop is pretty sure to afford a large grain traffic, it is not so sure to afford large profits. Last year the quality of the wheat was good and it bore a comparatively high price. This year the spring wheat is likely to be poor in quality, and all the wheat is almost sure to bear a low price. Indeed the price is already low. Russia has all its roads open and will compete for the supply of Europe much more effectively than last year, when the Black Sea was closed by war. Then the great surplus for export of the Pacific coast (the total wheat exports of the Atlantic coast have exceeded this year's estimated surplus of the Pacific coast but two or three times) will have a decided effect on the market. Great Britain seems not likely to have so very bad a crop as in 1877, and, altogether, the



opinion of the grain merchants is shown by their offering about 25 cents a bushel less for wheat for September delivery in Chicago than it brought last year in that month. This is an enormous difference to the farmer, as it all comes out of his profits if the cost of transportation to Chicago remains the same, the more so as the spring wheat has this year cost him more to raise than it did last year. Usually the roads carrying to Lake Michigan have been able to maintain remunerative rates on grain, which indeed is the chief support of many of them; but if prices are very low they may be compelled to make some reduction from their last year's rates. But, however this may be, the unprofitableness of the wheat crop in a large part of Minnesota and Iowa, and in view of the prospective low price, probably nearly everywhere that the crop has been light or merely indifferent, will have a decided effect on almost all other traffic of the wheat-carrying railroads. It is not simply a big wheat crop, it is a profitable one, that is needed to make business active in Minnesota and Wisconsin. And the effect on the trunk lines which carry from the West to the seaboard is very decided so far as the rates obtainable on grain are concerned. They will either not get much, or they must carry it at a low rate if prices are very low. The better rates obtainable last year, by water as well as rail, were largely due to the better prices of grain and the greater immediate consumptive demands. A year ago the lake rate from Chicago to Buffalo was twice as high as it now is. Europe now has several sources of supply open; vessels are arriving from Russia, and will soon begin to arrive from California, and there need be little haste about getting supplies from this coast. The grain can come forward leisurely, and this means that it will come forward cheaply, at least as long as navigation is open. There seems little prospect of making last year's profits on grain, even if there shall be last year's traffic, which latter is quite possible, though it will be somewhat differently distributed, the extreme northwestern roads carrying less and those of the Ohio valley probably carrying a great deal more, and the lake and canal route suffering somewhat.

#### Investments.

The issues of new securities during the first half of 1878 are given in the Belgian *Moniteur des Intérêts Matériels* as amounting to \$174,900,255 for government and city loans, \$978,000 for banking establishments, and \$101,927,490 for railroads and industrial corporations. Of the railroad capital, no less than \$90,191,000, or nearly 90 per cent. of the whole, was raised for French companies, Great Britain and its colonies, which stand next, being credited with but \$5,375,000, and America with nothing. The *Moniteur*, which is a good financial authority, believes that this half-year of exceptional financial dullness will be succeeded by great activity in many directions, the signal for which has been given by the conclusion of peace. Several countries are sure to come into the market for money, Russia alone, it is said, having incurred a debt of some \$700,000,000 during the war, most of which is still floating debt. France and Italy have immense railroad extensions planned, which will require large sums, though they will not be executed rapidly, as we understand rapidly in this country, and Italy especially is likely to make haste slowly and limit its expenditures according to its financial ability, which usually has been meagre. Private enterprises also have waited until the end of the war before coming before the public for money, and the *Moniteur* anticipates that there will soon be many asking for capital and recommending their enterprises. If this turns out to be true, it will probably increase the average rate of interest, and make it somewhat more difficult, or rather more costly, for the best American companies to place new issues of railroad bonds on the foreign market.

It must have struck the casual reader of the New York daily papers that there has been recently something of a revival of railroad bond advertisements. In 1873 and before the papers were full of them, but afterward for some years they were hardly to be seen at all. Evidently it had become useless to offer such securities—that is new issues of new companies: approved bonds of old, dividend-paying companies, which had passed through the fire, as it were, unscathed, never were so much in demand. But within the last half-year several new issues have been advertised, some of them by old and strong companies, to be sure, like that of the Chicago & Alton, but some also by new companies that never paid a dividend. The Syracuse, Binghamton & New York, the Chicago & Alton, the Dakota Southern, and the Scioto Valley have been offering their new bonds at the same time. It is noticeable, however, that none of these issues were by companies which had their roads

yet to build. The public seems at last indisposed to lend its money on the security of a charter and a contract for construction. The halcyon days for projectors, when they could borrow money in advance, and satisfy the lenders by a mortgage on what was bought with a part of the loan, have not yet returned, and seem not likely to, until some very painful lessons, which many have paid the savings of a lifetime to learn, have been forgotten.

American companies seem indisposed at present to ask for more capital. Loans now are mostly for the purpose of paying off old loans that are maturing, and in these cases the opportunity is usually favorable to the corporation, which is able to borrow at materially lower rates. Very few old companies have any extensions of importance under way (the Chicago & Alton is an exception, and the Atchison, Topeka & Santa Fe would be if it were an old company), and scarcely any is willing to borrow to increase equipment or lay second track or sidings. This latter work absorbed great sums about 1873, but since that time there has been comparatively little of such work done. One reason, doubtless, has been the slower growth of traffic, but another, it is probable, is the more skillful utilization of the roads. The limit of the capacity of a single track is rather the number of trains over it than the amount of traffic. Now, of late years on a great many roads there has been a great increase in the average train-load. Rolling stock, too, seems better utilized, and roads accommodate a material increase of traffic by the help of a few sidings and the prompt movement of cars, for which formerly provision would have been made by the expenditure of millions for second track and rolling stock. Aside from this, however, there is a very conservative feeling among railroad companies. They have learned how great the fluctuations of profits may be, and what great risk of ruin is run by stockholders who bond their roads heavily. A smaller proportion of funded debt to capital stock means safety to the stock, and in these days proprietors are most averse (when their stock is really worth something) to increasing the capital on which interest must be paid whether traffic is heavy or light, rates high or low.

When improvements or extensions are actually needed, there was never a better time for making them (for a company in good credit) than during the last year or two. Those who used to pay 8 per cent. can now get money at 6 per cent., and the cost of construction is hardly more than half as much as in the flush times of construction. The difference between building a branch for \$15,000 a mile, borrowed at 6 per cent., and building at \$25,000 per mile, borrowed at 8 per cent., is appreciable to the dullard. A profit of \$900 per mile warrants the first, while the second requires \$2,000 a mile. The change in the ideas of the railroad companies—those best qualified to judge of such enterprises—is strikingly shown by the fact that six or seven years ago, when construction and money were dear, they were full of projects, and now, when both are cheap, they can hardly be got to touch them. Hardly, we say; for there are several branches begun by old companies, mostly short and not very important. This is the most encouraging feature of the present condition of railroad construction. There may be ever so much new work begun by new companies, and almost the only conclusion we can draw therefrom is that money is easy to get. But when old companies (in times like these) undertake the construction of branches in their own territory—like those the Chicago, Rock Island & Pacific and the Chicago, Milwaukee & St. Paul have now under way—we may be pretty certain that there is likely to be a paying traffic for the new railroads. There is room for a good deal of such work in Minnesota, Iowa, and some in Nebraska and Kansas (as doubtless elsewhere), if only it is done under the intelligent guidance of traffic experts, such as the existing railroads can supply, and especially if it is not done too fast. In a vast number of cases a bankrupt railroad is only a railroad prematurely born. But this does not make the ruin less regrettable or the construction of the road less a mistake. The export of broadcloth to Guinea will be no less a blunder now because the time may come when the native Africans will wear dress suits. To supply a demand you must have regard to time as well as place.

#### Railroad Accidents in the German Empire in 1877.

The report of the German Imperial Railroad Bureau for the year 1877 gives the following statistics of railroad accidents, covering all railroads in the empire except those of Bavaria.

There were in all 602 derailments and collisions of trains while running. Of these trains, 148 were express and passenger trains, 48 mixed trains, and 406 freight trains or

locomotives running without trains. In addition, there were 678 derailments and collisions which occurred in switching, only 96 of which caused interruptions to the operation of the roads; and there were 631 other occurrences which disturbed the regular course of operations.

There was an accident to one passenger train out of every 7,712 dispatched, and to one freight train out of every 2,896. There was one derailment or collision to every 3,425,134 axle-miles run in 1877, against one to 2,719,000 in 1876, and one to 2,052,113 axle-miles in 1875, indicating a material increase in the safety of trains.

There was an examination before the courts in 269 cases of accident, and in 73 of these cases which were tried 26 persons were acquitted, and 68 were sentenced to imprisonment, the aggregate of their sentences amounting to 8 years, 7 months and 14 days, which is an average of 47 days each. There were 105 cases still pending at the time of making the report. There were also 565 fines, of the average amount of \$2.10 each, 54 reprimands, and 37 discharges for fault in accidents.

The number killed and injured, aside from 111 killed and 19 injured in deliberate attempts to commit suicide, was 1,661, distributed as follows:

	Killed.	Injured.	Total.
Passengers.....	10	104	120
Employees.....	181	638	819
Laborers.....	70	372	442
Other persons.....	100	120	220
Total.....	427	1,234	1,661

Of the injured, 82 died afterward, 159 got well within a week, 296 more got well by the end of the fourth week, 336 were ailing more than four weeks, 109 more than three months, 31 more than six months, and 8 are not expected ever to recover entirely. When the report was made, 177 were still suffering, and the time of injury is not known in 36 cases.

There were 1,527 accidents not connected with the operation of the road in which deaths or injuries occurred. Of these 924, or 60½ per cent., were subjected to a judicial examination. In 850 of these cases no indictment was found, in 10 cases there were trials by which five persons were discharged and eight were sentenced to imprisonment for an average term of 6½ days. The other 64 cases were not yet tried when the report was issued. Besides, there were 24 cases in which fines of the average amount of about \$1.20 each were imposed, three reprimands, and four dismissals.

One out of every 10,879,528 passengers was killed, and one out of 1,673,484 was wounded. For three years the number of passengers and employees per one killed or injured has been:

	Passengers.		Employees.	
	Killed.	Injured.	Killed.	Injured.
1875, one to.....	11,402,067	2,443,300	648	161
1876 " ".....	11,830,447	2,957,611	819	183
1877 " ".....	10,879,523	1,673,484	703	199

The accidents to employees seem to be frightfully common. On such a road as the Chicago, Rock Island & Pacific, with its average force of 5,344 men in 1877-78, the equivalent would have been 7.6 employees killed and 26.8 wounded in the year. This, however, may be equalled or even exceeded on our roads, as we have not sufficient statistics to enable us to determine, and the accidents above include everything, and not train accidents alone.

The roads worked by the Government had comparatively the largest number of accidents. The number of axle-miles run to one passenger killed or injured was:

	One to
On the Government roads.....	2,413,524 axle-miles
On the larger private roads (93 miles or more).....	3,115,435 "
On the smaller private roads (less than 93 miles).....	2,355,552 "

If the smaller and larger private roads be put together, we have one person killed or injured to 3,087,755 axle-miles; and for the same movement, 1.28 persons on the Government roads to one on the private roads.

The number of accidents (not of injuries to persons) on all roads was at the rate of the following number of axle-miles of all trains for three years:

	Accidents.	Accidents.	Accidents.
	1875.	1876.	1877.
1875—One accident to.....	2,088,370	9.3	
1876 " ".....	2,372,240	11.2	
1877 " ".....	2,639,477	13.0	

This is equivalent to a decrease in the average frequency of accidents of about 15 per cent. from 1875 to 1876, and of 13 per cent. from 1876 to 1877; and it is stated that there was a decrease of 19 per cent. from 1874 to 1875. This would make a decrease of no less than 40 per cent. from 1874 to 1877. The figures given above for the proportion of killed and injured to the whole number of passengers and employees indicate, however, that if the accidents have become fewer in number, they have, at the same time become deadlier in their effects to passengers. The average risk of death was 8 per cent. greater, and of injury 80 per cent. greater in 1877 than in 1876 for passengers. The chances of being killed increased meanwhile 25 per cent. for the employees, but for being injured it decreased about 9 per cent.

#### The World's Coal and Iron Production.

Mr. John Pechar, a railroad officer of Teplitz, Germany, has prepared for the Paris Exhibition a work on "Coal and Iron in All Countries of the Earth." The coal production of the world he gives as having increased from 185,135,696 metric tons (2,204 lbs., and so not 2 per cent. less than our long tons, in which coal is commonly reckoned in this country as well as Great Britain) in 1866 to 286,163,188 tons in 1876, or more than 54 per cent. Of the total production in 1876, 47.4 per cent. was mined in Great Britain, 16.9 per cent. in Germany, 16.9 per cent. in the United States, 5.9 per cent. in France, 5.0 per cent. in Little Belgium, and 4.7 per cent. in Austria-Hungary, which accounts for 90.8 per



cent. of the whole. All Asia is credited with but 4,120,000 tons.

The greatest proportional increase in production in the ten years has been in Russia, 529½ per cent., but even in 1876 it produced but 1,709,000 tons. The smallest increase was in Belgium, 12½ per cent., and in Great Britain, 81½ per cent. The amount of the increase in Great Britain, was 32,500,000 tons, and more than in any other country, the United States following with an increase of 26,500,000 tons, or 121 per cent. This country and Russia, apparently, are the only ones where a very great increase of production is possible, that is, where there are great resources entirely undeveloped, if we exclude the Asiatic countries, where scarcely any effort is made or seems likely to be made to mine coal on a large scale.

As to iron, the production of pig increased from 9,502,626 tons in 1866 to 14,324,619 in 1876, or 47.8 per cent.—very nearly in the same proportion as the coal production. In 1866 Great Britain produced 48½ per cent. of the total; in 1876, 46½ per cent. The countries of largest production supplied the following percentages of the total in the three years:

	1866.	1876.
Great Britain.....	48.4	46.5
United States.....	12.9	17.1
Germany.....	10.5	11.3
France.....	13.2	10.2
Belgium.....	5.1	3.4
Russia.....	3.3	3.9
Austria-Hungary.....	3.0	2.8
Sweden.....	2.4	2.5
Luxemburg.....	0.5	1.6

The percentage of increase from 1866 to 1876 was 45 per cent. in Great Britain, 92 in the United States, 61½ in Germany, and 15½ in France. The only countries that have exported extensively have been Great Britain and Belgium, except recently Germany. The other countries, though some of them have exported certain kinds of iron, have on the whole imported as much as or more than their exports. The present number of Bessemer steel works is given by Pechar as 97, distributed as follows:

	No. of works.	Production in tons.	P. c. of total production.
Great Britain.....	25	762,000	36.1
United States.....	11	534,412	25.3
Germany.....	18	390,334	18.5
France.....	7	218,000	10.4
Austria-Hungary.....	13	97,470	4.6
Belgium.....	2	75,258	3.6
Sweden.....	19	22,138	1.1
Russia.....	2	8,636	0.4
Total.....	97	2,108,384	100

The production of the works thus has varied greatly, from only 1,165 tons each in Sweden to 48,583 tons in the United States. The 97 works have 334 converters, whose average production (in 1877, we believe), was 6,312 tons each. Many of these were not at work all the time, and doubtless a considerable number are antiquated, uneconomical, and never will be used again to any extent. Their total production for the year reported would have provided material for 22,350 miles of track laid with 60-lbs. rails, and at this rate all the roads in the world could be provided with such rails once in about 12 years. It must be remembered, on the one hand, that not all the steel is used for rails, and that provision has to be made for the construction of new as well as the renewal of old lines; and on the other hand, that iron is by no means out of the market yet, that a very large proportion of the roads (most of those in this country) use rails lighter than 60 lbs. to the yard, and, especially, that the capacity of the existing works is vastly greater than their production during the year reported.

#### Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

*New York & Manhattan Beach.*—A branch has been completed from Manhattan Beach, N. Y., eastward along the Coney Island shore 2 miles. It is of 3 ft. gauge.

*Syracuse, Geneva & Corning.*—Extended from Geneva, N. Y., north to Lyons, 13 miles.

*Rochester & Northern Minnesota.*—The first track is laid from Rochester, Minn., north to New Haven, 10 miles.

*St. Paul & Pacific.*—Extended from Melrose, Minn., west by north to Sauk Centre, 8 miles.

*Minnesota Valley.*—Completed from Sleepy Eye Lake, Minn., northwest to Redwood Falls, 26 miles.

*Atchison, Topeka & Santa Fe.*—On the Southern Extension track is laid from La Junta, Col., southwest 22 miles.

This is a total of 81 miles of new railroad, making 900 miles completed in the United States in 1878, against 751 miles reported for the corresponding period in 1877, 1,010 in 1876, 538 in 1875, 839 in 1874, 1,872 in 1873, and 3,237 in 1872.

NAMES OF RAILROADS are often curiously non-suggestive or what or where the road really is. Many roads have names which are a great deal too big for them, though the actual road may fit some part of the name. A road having the name of a State, with or without "Central" added, at least suggests that it is in the State, but there are some whose names give no clue to their locality. What possible or probable line could a man evolve from his inner consciousness to fit the European & North American, for instance?

One of the biggest names we can recall is that of the Florida, Memphis & Columbia River, a company which began to build a road out in Missouri some years ago. The name was too much for it, however, and it died an early death. Another company scorned State and even National lines and called itself the American Central; it succeeded in building a little road, which is now a branch of the Chicago, Burlington & Quincy.

A good example of honesty in names was set lately by the

Evansville & Crawfordsville Company, which changed its name to Evansville & Terre Haute, simply because that name described exactly the road it worked. It has had no imitators, however, and does not seem likely to have any. It may be said for our names, in spite of their defects, that they are more descriptive than those in use in some foreign countries, the Empress Elizabeth Railroad, or the Emperor Ferdinand Northern Railroad in Austria, for instance, or the Dom Pedro II. Railroad in Brazil.

Speaking of names, "Midland" in this country has been a curiously unfortunate name. No railroad bearing it has been successful. The New York & Oswego Midland is a most conspicuous failure; the New Jersey Midland is bankrupt, the Midland Pacific defaulted, the Kansas Midland was utterly bankrupt until swallowed by a stronger company. The half-finished Minnesota Midland has already been in financial troubles, and even in Canada the Midland is thoroughly bankrupt and broken down. Evidently Midland should be dropped.

WATER RATES have remained almost unchanged by lake and canal for several weeks past, at the lowest figures ever known. There has been absolutely no change in quotations in lake rates, which for several weeks have stood at 1½ cents per bushel for corn from Chicago and 1½ cents for wheat from Milwaukee to Buffalo; but it is reported that concessions have been made on these rates. There have been very slight fluctuations in canal rates, which were reported last Tuesday at 4½ cents per bushel for wheat, 3½ for corn, and 2½ to 2¾ for oats from Buffalo to New York.

Ocean rates have been lower than at any other time this year, going down to about 6d per bushel from New York to Liverpool, but at this time they have recovered a little, and as the shipments of the immense wheat crop of California are now fully begun, and the Ohio valley winter wheat has begun to come forward, and the farmers in the corn exporting districts will soon have time to bring forward the remainder of their stocks, there is a prospect that there will hereafter be a good demand for grain room, which will tend to keep up ocean rates in spite of low prices for grain.

EAST-BOUND RATES have been advanced, but the figures reached are still so very low that there can be very little profit in the through traffic—25 cents per 100 lbs. for fourth-class freight, and 20 cents for grain. This fact was so well appreciated that a day or two after the above rates, which took effect Aug. 1, were adopted, another meeting was held which decided to raise them to 25 cents for grain and 30 cents for fourth-class freight, to take effect Aug. 5. This time the difference of three cents per 100 lbs. in favor of Baltimore is made: the July tariff left the Philadelphia and Baltimore rates the same, that is, two cents lower than the New York rate. Last year at this time the rates were 35 cents for fourth-class freight, and 30 cents for grain, and these were the lowest regular rates that had ever been agreed upon, and they were advanced five cents a month later, and a good business was had with them.

AN EAST-BOUND POOL is said to be contemplated again, and there was to be a meeting to consider the subject in Chicago last Wednesday, the result of which was the calling of a second meeting, to be held at Long Branch Aug. 7.

#### Contributions.

##### Request for Material for the History of Locomotive Construction.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Being engaged in the preparation of a comprehensive "History of the Development of Locomotive Construction," and having now reached the part which treats of recent years, I take occasion to direct the following request to my fellow engineers, earnestly desiring to give due credit, so far possible, for every inventor's services.

Every mechanic or engineer who is conscious of having made any invention materially improving the construction of the locomotive as a whole, or that of any of its parts, or their arrangement, or who has discovered new methods of treating and utilizing them, is requested to send me, before Sept. 30 an illustrated description of the same, concise and clear as possible (drawings on tracing-cloth ½ of the actual size.)

It will be understood that only such inventions and constructions have a place in history which have come into actual use on a large scale, and have remained permanently in use outside of the circle in which the inventor or constructor had control. Therefore there should be added concise statistics of the extent to which the invention has been adopted, etc.

I will also be especially grateful for other interesting information in the department of locomotive construction and manipulation, concerning the lives of eminent mechanical engineers, and relating to circumstances and events which, directly or indirectly, have exercised any influence in the development of the locomotive.

The decision as to what part of the information sent me is suitable for insertion in my book, as well as to the form in which it shall appear, of course, I reserve to myself.

BERLIN, June 30, 1878.

M. M. BARON VON WEBER.

Engineer, Imperial Councillor, Member Institute Civil Engineers.

[Material intended for Baron von Weber may be addressed to him at the "Handelsministerium, Berlin," or, if left at the office of the *Railroad Gazette*, we will see that it is forwarded. But we beg to call

attention to the fact that it is not mere projects and inventions that are wanted, but inventions that have been tried, proved good, and adopted, where the personal influence of the inventor was not effective—inventions which have had an actual effect on the present condition of locomotive engineering, not those which the inventor expects to make a revolution in its future condition. Baron von Weber's work is to be history, not prophecy.—EDITOR RAILROAD GAZETTE.]

#### Calculating Valve Friction.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Will you please do me the favor to look over the accompanying calculation, and tell me if I have made my calculations correctly? It looks all right to me, but the loss of power from steam-pressure on the valve is shown to be so great that I can hardly believe I have not made a mistake somewhere. Of course sizes, speed, etc., were only taken as averages. The reason I ask you about this is because I have devised a new style of steam-chest and slide-valve, in which for an 18-in. cylinder with ports ¾ × 18 the area of valve surface pressed upon by steam would only be 22 square inches, and this for only part of the stroke, viz., when both ports were entirely closed.

H. B. M.  
Area of slide valve of loco = 12' × 16' = 192 sq. in.  
Now take circumference of wheel at 5,280 ft. = 352 revolutions, or, at speed of 30 miles per hour 176 revolutions per minute.  
If valve travels 4 in. it will make 8 in. per revolution = 117 ft. per minute.  
Pressure of steam 100 lbs. to the inch = 192 × 100 = 19,200 lbs.  
Coefficient of friction from Trautwine's table, page 600 = 0.105.  
2,016 × 117 = 235,872 foot pounds.  
235,872 ÷ 33,000 = 7.14 horse-power; or for both valves, 14.28 horse-power.

[Your calculation appears to be correct, but the size of the valve which has been taken is larger than those in ordinary use, which are seldom more than 9 in. wide. This would reduce the amount of power consumed 25 per cent. Then you have not taken any account of the pressure under the valve. When the steam is cut off the port under the valve is full of steam, which exerts more or less upward pressure. The same thing occurs when the exhaust is opened; the exhaust cavity is then filled with the exhaust steam, at a comparatively low pressure, it is true, but still it has a considerable influence on the pressure on the valve.

You have also assumed that your valve fits its seat and is absolutely steam-tight—a condition of things which seldom exists in practice, and probably in most cases more or less steam gets between the face of the valve and its seat.

On the other hand, it is probable that the coefficient of friction is at times less than 0.105 and at others much higher. In fact, experiments have shown that the friction of slide-valves is very irregular and that no exact results can be reached by calculation.—EDITOR RAILROAD GAZETTE.]

#### Coefficients of Friction.

The following notes of experiments on Lubricants made at the Mechanical Laboratory of the Stevens Institute of Technology were submitted to the Master Mechanics' Convention and will be of interest to our readers. The coefficients of friction have been obtained by careful experiments on one of Professor Thurston's oil-testing machines:

##### COEFFICIENTS OF FRICTION.

Determined in the Mechanical Laboratory, Stevens Institute of Technology.

CAST-IRON JOURNAL AND STEEL BOXES (a).

	At pressure per square inch, lbs. of					
	50	100	250	500	750	1,000
Bleached Winter Sperm:	Coefficient of friction per cent. was					
At 150 ft. per minute	0.013	0.008	0.005	0.004	0.0043	0.009
Resistance to starting	0.070	0.135	0.140	0.150	0.1850	0.180
For instant of stopping	0.030	0.025	0.040	0.030	0.0300	0.030
West Virginia:	Coefficient of friction per cent. was					
At 150 ft. per minute	0.0213	0.015	0.009	0.00525	0.0050	0.0100
Resistance to starting	0.11	0.135	0.14	0.15	0.185	0.18
For instant of stopping	0.025	0.025	0.026	0.018	0.0147	0.017
Pure Lard Oil:	Coefficient of friction per cent. was					
At 150 ft. per minute	0.02	0.0137	0.0085	0.00525	0.0066	0.0125
Resistance to starting	0.07	0.11	0.11	0.10	0.12	0.12
For instant of stopping	0.01	0.0225	0.016	0.016	0.020	0.019

STEEL JOURNAL AND BRASS BOXES (b).

	Pressure in lbs. per square inch.	
	500 lbs.	1,000 lbs.
Bleached Winter Sperm:	Coefficient of friction at 150 ft. per min.	
Pure Lard Oil:	0.0025	0.008
Coefficient of friction at 150 ft. per min.	0.004	0.009

Temperature in all cases less than 115° Fahrenheit.

Ratio— $\frac{b}{a}$  for sperm oil = 0.75 at 500 lbs. pressure, and 0.888 at 1,000 lbs. pressure; for lard oil it was 0.80 at 500



lbs., and 0.90 at 1,000 lbs. pressure.

#### WROUGHT-IRON JOURNAL, 3 1/2 IN. DIAMETER.

	Coefficients of Friction.		Durability: Feet Run.	
	Sperm.	Lard.	Sperm.	Lard.
Pressure 300 lbs.	0.0046	0.0059	19,800	10,557
Pressure 500 lbs.	0.0033	0.0044	13,500	7,515

Soft steel journal 3 1/2 in. diameter (Pennsylvania Railroad standard) gives same coefficients. Neither the steel nor the wrought-iron journal was run to a state of maximum smoothness.

## General Railroad News.

### MEETINGS AND ANNOUNCEMENTS.

#### Dividends.

Dividends have been declared as follows:  
New York, Providence & Boston, 2 1/2 per cent., quarterly, payable Aug. 10.

Cedar Rapids & Missouri River (leased to Chicago & Northwestern), 3 1/2 per cent., semi-annual, on preferred, and 1 per cent., quarterly, on common stock, both payable Aug. 1.

Connecticut & Passumpsic Rivers, 1 per cent., semi-annual, on preferred stock, payable Aug. 1.

Massachusetts (leased to Connecticut & Passumpsic Rivers), 1 per cent., semi-annual, payable Aug. 1.

Terre Haute & Indianapolis, 4 per cent., semi-annual, payable Aug. 5.

#### Foreclosure Sales.

The New Jersey West Line road was offered for sale in Newark, N. J., July 27, under a decree of foreclosure from the Court of Chancery of New Jersey. Two bidders were present, but the highest bid made was \$80,000, which the Master refused to accept, and he adjourned the sale to Aug. 3.

The Ashtabula, Youngstown & Pittsburgh road is advertised to be sold under foreclosure in Youngstown, O., Aug. 24. It extends from Youngstown, O., to Ashtabula Harbor, 62.6 miles, and is worked by the Pennsylvania Company.

The Indianapolis, Bloomington & Western, Main Line, will be sold in Bloomington, Ill., Aug. 31, by J. A. Jones and Wm. P. Fishback, Masters, under concurrent decrees of foreclosure granted by the United States Circuit Courts for Indiana and the Southern District of Illinois. The sale will include the 202 miles of road from Indianapolis to Pekin, Ill., with all the franchises, etc., and the equipment, except such of the equipment as has been by the Masters apportioned to the Western Extension. The sale will be made subject to valid claims and judgments for right of way; to taxes due and unpaid; to a contract for the lease of 500 cars from Oliver Adams, and to the claims allowed by the Courts for labor and materials furnished for six months prior to Dec. 1, 1874, purchasers to have six months time in which to satisfy such claims. Each bidder must deposit \$50,000 as security and the purchaser must in addition pay \$50,000 cash on the day of sale, and on confirmation of the sale such additional sum in cash as may be needed to pay the costs and Receiver's debts; the rest of the purchase-money may be paid in bonds and coupons at their *pro-rata* value. The sale will be without appraisal and not subject to redemption, and full title will be passed to the purchaser.

### ELECTIONS AND APPOINTMENTS.

Atlanta & West Point.—At the annual convention in Atlanta, Ga., July 25, the old board was reflected as follows: W. B. Berry, John S. Bigby, Newnan, Ga.; D. N. Spear, La Grange, Ga.; L. M. Hill, Washington, Ga.; Ferdinand Phinizy, B. C. Yancey, Athens, Ga.; John P. King, Augusta, Ga. The board reflected John P. King, President; L. P. Grant, Superintendent; W. P. Orme, Secretary and Treasurer.

California Pacific.—At the annual meeting in San Francisco, July 31, the following directors were chosen: R. P. Hammond, George E. Gray, J. L. Willcutt, C. F. Crocker, N. T. Smith, C. J. Robinson, J. O. B. Gunn. The board elected R. P. Hammond President; George E. Gray, Vice-President; J. Gunn, Secretary; J. L. Willcutt, Treasurer.

Celina, Van Wert & State Line.—At the annual meeting in Van Wert, O., July 15, the following directors were chosen: T. J. Godfrey, P. Freisinger, James Clark, J. M. C. Marble, J. S. Brumback, L. Patterson, H. C. McGovern, T. S. McKim, W. H. Pennell. The board elected H. C. McGovern, President; J. N. Alexander, Secretary; W. H. Pennell, Treasurer.

Central Pacific.—At the adjourned annual meeting in San Francisco, July 30, the following directors were chosen: David D. Colton, Charles Crocker, Charles F. Crocker, E. W. Hopkins, E. H. Miller, Jr., Leland Stanford, San Francisco; C. P. Huntington, New York. The new directors were E. W. Hopkins and Charles F. Crocker, who succeed Mark Hopkins, deceased, and M. F. Gage.

The board reflected Leland Stanford President; C. P. Huntington, First Vice-President; Charles Crocker, Second Vice-President; D. D. Colton, Financial Director; E. H. Miller, Jr., Secretary; E. W. Hopkins, Treasurer.

Chester & Lehigh.—Mr. Holmes Hardin, of Chester, S. C., has been chosen President, in place of Dr. A. H. Davega.

Cleveland, Columbus, Cincinnati & Indianapolis.—Mr. A. J. Smith is appointed General Ticket Agent, in place of S. F. Pierson, resigned. He has been Mr. Pierson's assistant several years.

Cleveland, Painesville & Chardon.—The officers of this company, successor to the Lake View & Collamer, are: President, G. F. Lewis; Vice-President and Treasurer, William E. Lewis. Office at Cleveland, Ohio.

Freehold & Jamesburg.—At the annual meeting in Camden, N. J., July 30, the following directors were chosen: Richard S. Conover, South Amboy, N. J.; Charles R. Bennett, T. S. Bucklelew, Hon. Joel Parker, Freehold, N. J.; Benjamin Fish, Lewis Perrine, Trenton, N. J.; J. N. DuBarry, Strickland Kneass, George B. Roberts, Philadelphia, Pa.

Green Bay & Minnesota.—Mr. W. K. McFayden has been appointed Master Mechanic, in place of J. L. Lamb, resigned. Mr. McFayden was recently on the Chicago & Lake Huron road.

Merchants' Dispatch.—Mr. John Crampton has been appointed Foreign Freight Agent in Chicago. He was recently General Western Agent at Kansas City for the Southwestern Railway Association, before that was Secretary of

the Trunk Lines pool in New York, and for several years was General Freight Agent of the Great Western of Canada.

Nebraska City, Taber & Botna Valley.—The officers of this new company are: President, J. T. Baldwin; Vice-President, J. W. Sweet; Secretary, W. M. Brooks; Treasurer, T. J. Evans. Office at East Nebraska City, Ia.

Saginaw Valley & St. Louis.—The new board has elected the following officers: President, D. H. Jerome; Vice-President, Geo. F. Williams; Treasurer, A. W. Wright; Secretary, Ezra Rust.

St. Louis & San Francisco.—Hon. James Baker, having resigned the presidency of this company, Cornelius J. Bergen, Esq., has been elected Vice-President, with full power of President during the vacancy in that office.

Southern Pacific.—At the annual meeting in San Francisco, July 31, the following directors were chosen: Charles Crocker, D. D. Colton, Willard V. Huntington, Charles Mayne, H. M. Newhall, N. T. Smith, J. L. Willcutt.

Southwestern Railway Association.—Mr. H. H. Courtright is now the only General Western Agent, Mr. John Crampton having resigned.

### PERSONAL.

—Hon. James Baker has resigned his position as President of the St. Louis & San Francisco Company.

—Mr. Thomas Kelso, for thirty-seven years a director of the Philadelphia, Wilmington & Baltimore Company, and probably the oldest railroad director in the country, died at his residence in Baltimore, July 27, in the 94th year of his age. He was born in Ireland, but came to Baltimore at an early age. When grown up he went into business with his brothers as a butcher and accumulated a considerable fortune. He retired from active business nearly thirty-five years ago, but was still interested in several manufacturing enterprises. He had been a member of the Methodist Church seventy-one years, and had made many large gifts for religious and benevolent purposes. He was also a director of the Seaboard & Roanoke Company and of the Baltimore Steam Packet Company.

—Mr. S. F. Pierson, for many years General Ticket Agent of the Cleveland, Columbus, Cincinnati & Indianapolis road, has resigned his position from July 31. Mr. Pierson is President of the General Passenger and Ticket Agents' Association.

—The officers and employees of the Intercolonial Railway gave a dinner to Mr. C. J. Brydges, General Superintendent of Government Railways, at Moncton, N. B., July 24. Speeches were made by Mr. Brydges and others and the whole affair passed off very pleasantly.

### TRAFFIC AND EARNINGS.

#### Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending June 30:

	1877-78.	1876-77.	Inc. or Dec.	P. c.	
Atlanta & West Point.....	\$321,141	\$311,159	I.	\$9,982	3.2
Expenses.....	175,705	176,206	D.	504	0.3
Net earnings.....	\$145,436	\$134,950	I.	\$10,486	7.8
Earn. per mile.....	3,691	3,577	I.	114	3.2
P. c. of expenses.....	54.71	56.63	D.	1.92	3.4
Bur. Cedar Rapids & Northern.....	1,614,763	967,484	I.	647,279	66.9
Expenses.....	1,054,452	771,063	I.	283,389	36.8
Net earnings.....	\$560,311	\$196,421	I.	\$363,890	185.3
Earn. per mile.....	3,938	2,629	I.	1,309	50.3
P. c. of expenses.....	71.48	79.70	D.	8.22	10.3

Six months ending June 30:

	1878.	1877.		
Bur. Cedar Rapids & Northern.....	\$793,531	\$428,649	I.	\$364,882
Net earnings.....	233,983	86,956	I.	147,027
P. c. of expenses.....	70.52	79.65	D.	9.13
Denver & R. Grande.....	437,621	306,137	D.	131,484
Net earnings.....	165,640	138,308	I.	27,331
P. c. of expenses.....	82.05	54.85	I.	7.20
Mobile & Ohio.....	936,434	820,849	L.	109,585
Philadelphia & Erie.....	1,361,652	1,389,863	D.	128,211
Net earnings.....	317,821	382,184	D.	64,363
P. c. of expenses.....	74.91	72.40	L.	2.42
Philadelphia & Reading.....	5,670,427	6,393,492	D.	723,065
Month of June:				
A. & Great Western.....	\$301,256	\$312,828	D.	\$11,572
Mobile & Ohio.....	90,341	88,849	I.	1,492
Philadelphia & Erie.....	219,024	250,705	D.	31,681
Phila. & Reading.....	1,468,659	1,199,518	L.	269,141

Second week in July:

St. Louis, Iron Mt. & Southern.....	\$70,200	\$87,253	D.	\$17,053	19.5
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Third week in July:

Denver & Rio Gr.....	\$28,619	\$19,038	I.	\$9,581	50.4
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Week ending July 19:

Gt. Western, of Can.....	\$88,313	\$72,591	I.	\$15,722	21.7
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Week ending July 20:

Grand Trunk.....	\$145,794	\$109,078	D.	\$36,716	33.6
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#### Coal Movement.

Coal tonnages for the week ending July 30 are reported as follows:

	1878.	1877.	Increase.	P. c.
Anthracite.....	610,046	480,338	129,708	27.0
Semi-bituminous.....	73,193	34,616	38,577	111.5
Bituminous, Pennsylv'a.....	28,929	27,131	1,798	6.6

The anthracite tonnage is the largest reported for many weeks, but is followed by a suspension for one and probably two weeks. The situation in the anthracite country just now is not pleasant and there are rumors of a general strike.

Semi-bituminous tonnage for the week is large, owing chiefly to great shipments from the Cumberland Region. Cumberland production is gaining and Clearfield falling off, thus reversing last year's situation.

#### California Through Freights.

Shipments of through freight eastward over the Central Pacific in June were: San Francisco, 4,241 tons; Interior points, 353 tons; total, 4,624 tons, or 463 car-loads. The principal items of freight were: Wool, 2,065 tons; tea, 771 tons; salmon, 271 tons; wine, 293 tons.

#### Live Stock Rates.

A Chicago dispatch of July 29 says: "The rates on live stock between Chicago and the Eastern markets are said to be very much demoralized. It was reported to-day that stock had been taken from here to Buffalo at a rate of \$80 per car. This is \$5 less than one-half the agreed tariff. There is no evidence showing that any small shipper has benefited by such rate as the aforementioned, but it is alleged that only the 'eveners,' and possibly a few of their friends, can obtain these low figures. This sort of discrimi-

nation, for evidence is not wanting that it amounts to that, is causing much dissatisfaction among the smaller shippers. Rates out of St. Louis are quite as badly demoralized as from Chicago, and it has been ascertained that the 'eveners' are paying only \$50 per car from that city to New York, while the small fry are obliged to \$75 per car to Buffalo, that being the full tariff price."

#### Grain Movement.

Receipts and shipments of grain of all kinds, for the week ending July 30, for five years, have been reported as follows, in bushels:

The receipts of the eight leading Northwestern markets have been:

	1878.	1877.	1876.	1875.	1874.
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The total shipments of the same markets for the same week have been:

	1878.	1877.	1876.	1875.	1874.
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The number of bushels and the percentage of the total of the above shipments which went by rail were:

	1878.	1877.	1876.	1875.	1874.
1,347,944	583,147	1,032,825	750,214	346,967	
43.5 p. c.	18.0 p. c.	31.3 p. c.	18.5 p. c.	16.5 p. c.	

These rail shipments have been exceeded but once or twice since navigation opened.

The receipts at the seven Atlantic ports for the same week have been:

	1878.	1877.	1876.	1875.	1874.
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Of these receipts this year, 50.6 per cent. were at New York, 17.7 at Baltimore, 13 at Montreal, 10.2 at Boston, 5.3 at Philadelphia, 3 at New Orleans and 0.2 per cent. at Portland.

Receipts and shipments at Chicago and Milwaukee for the week ending July 29, were, in bushels:

	Receipts.	Shipments.
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Chicago.....2,541,5522,500,925  
Milwaukee.....450,300184,800

Receipts and shipments at Buffalo for the same week were:

	Receipts.	Shipments.
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By rail.....819,2001,433,595  
By water.....1,221,268910,075

Total.....2,040,4682,343,670

For the same week 2,559,639 bushels were received at New York (55 per cent. by rail), 1,300,700 at Baltimore, 796,600 at Philadelphia, and 522,815 at Boston. The receipts at Baltimore are among the largest ever known, though until recently this season that market has had disproportionately small receipts. The sudden increase is doubtless caused by the marketing of the first threshings of the winter wheat crop of the Ohio valley, which this year is extraordinary in amount and quality. Baltimore usually receives a great deal of corn and comparatively little wheat. But for the last week above reported its wheat receipts were 1,082,600 bushels, or five-sixths of its total receipts.

#### Southwestern Railway Association.

At the monthly meeting in Chicago, July 24, it was resolved, on recommendation of the Executive Committee, to make a reduction of \$10 per car on hogs from all Missouri River points to St. Louis, other Mississippi River points and Chicago. The rate on salt from Toledo to Missouri River points was advanced 5 cents, making it 65 cents per barrel from Aug. 1.

#### East-Bound Rates.

An advance in rates from Chicago to New York, to take effect Aug. 1, has been agreed upon. The advance is from 18 to 25 cents per 100 lbs. for fourth-class freight, and from 16 to 20 cents for grain, with the usual differences to Baltimore, Philadelphia and Boston.

At a meeting held in Chicago, July 31, a further advance in rates was agreed on and the following rates adopted, to take effect Aug. 5:

Chicago to	Fourth class.	Grain.	Flour.
Baltimore.....	27 cts.	22 cts.	44 cts.
Philadelphia.....	28 "	23 "	46 "
New York.....	30 "	25 "	50 "
Boston.....	35 "	30 "	60 "

It was also agreed that all articles heretofore taken at grain rates should be charged fourth-class. It was decided to charge 2 cents per 100 lbs. when cars are sent to packing and slaughter-houses in Chicago, and to make an extra charge of 10 cents per 100 lbs. when refrigerator cars are furnished for cured meats.

#### Pacific Through Rates.

The following circular, dated July 29, has been issued by the general freight agents of the Union and Central Pacific roads, and by their joint general agent in New York:

"Notice is hereby given of the following changes in the California classification of the Union and Central Pacific railroads, taking effect this day: Dry goods, cotton piece goods, cotton bags, and cotton bagging, blankets, canvas, clothing, enameled cloth, duck, quilts, comfortables, webbing, wadding, woolen goods and yarns in cases will be classified double first class. Above-named articles in bales shipped at owner's risk of chafeage, under written release, once and a half first class. Ribbons, silk goods, thread and shoe-thread in cases, double first class; in bales, not taken. Chairs and other furniture of all descriptions that have heretofore been classified lower than fourth class will hereafter take fourth-class rate. Pianos, organs, melodeons, and other musical instruments, well boxed, will be classified once and a half first class. Rubber boots, shoes, clothing, and goods not otherwise specified, will be classified third class. Druggists' rubber goods, first class. Rubber hose, in cases, class A. Rubber hose, in bales, released, fourth class."

The first-class rate is \$6 per 100 lbs., from New York to San Francisco. Rates by the Pacific Mail are lower, and by clipper, around Cape Horn, they are usually but \$1.50 to \$2.50 per 100 lbs. The change is equivalent to a considerable allowance on part of the first-class goods, mostly textile fabrics. Cheap, light cottons are estimated at this rate to cost 3 cents per yard for transportation, an advance of one cent per yard in the cost of getting it to California.

It is said that the old rates are offered to all shippers who will contract to ship exclusively by railroad hereafter for a year or more.

#### Southwestern Railway Association Rates.

The following is the text of the circular issued by J. W. Midgely for the information and direction of the roads forming the Southwestern Railway Association: "On and after this date, and until these rates are changed, the railroads above-named will charge on hogs, in car loads, from Kansas City, Leavenworth, Atchison, and St. Joseph: To St. Louis and other Mississippi River points, \$40 per car; to Chicago, \$57.50 per car. Eastward bound, from Missouri River points, 220 sacks of flour will be rated the same as 100 barrels of flour. On and after July 28, 1878, bar iron, in car-load lots, when consigned to and intended for the use of railroad companies, will be rated class C. On and after



Aug. 1, 1878, salt, n car-load lots, from Toledo to Missouri River points, will be charged 65 cents per barrel. Any arrangements conflicting with the above are hereby canceled."

### THE SCRAP HEAP.

#### Railroad Manufactures.

The Brooks Locomotive Works, at Dunkirk, N. Y., are working on contracts for six engines for the Rochester & State line; four for the Buffalo & Southwestern; six for the Springfield, Jackson & Pomeroy; three for the Kendall & Eldred, and one for the St. Joseph & Des Moines.

The Harlan & Hollingsworth Co., at Wilmington, Del., has just completed four very handsome sleeping-coaches for the Woodruff Sleeping-Car Co.

The Wason Manufacturing Co., at Brightwood, Mass., has just finished two first-class passenger cars for the Housatonic road.

In the Shenango Valley, in Pennsylvania, there are 30 blast furnaces, of which only five are now running, one at Sharpsville, one at West Middlesex, and three at Sharon.

Porter, Bell & Co., at Pittsburgh, have turned out more locomotives so far this year than during the whole of last year.

The Windsor Car Stove Co., at Cleveland, O., has received a number of orders, and the fall trade promises to be very good.

Anderson Brothers & Co. are building at Canton, Baltimore, a new rolling-mill to make bar-iron, bolts, nuts and similar work. It will be ready to start about Sept. 1.

The Chicago, Burlington & Quincy is said to have bought 20,000 tons of steel rails at \$44 per ton, delivered in Chicago, the order being divided between the North Chicago and Cleveland mills.

The Kansas Rolling Mill Co., at Rosedale, Kan., is making 150 of Lowrie's improved wrought-iron draw-bar for several Kansas roads.

The Buffalo Scale Co., at Buffalo, N. Y., reports sales this year of an unusual number of heavy scales. The company is putting up a 30-ton track scale at a new mill at Niagara Falls.

The Ohio Falls Car Co., at Jeffersonville, Ind., recently received an order for 100 freight cars for the Atchison, Topeka & Santa Fe road.

The Rogers Locomotive Works, at Paterson, N. J., have delivered two engines to the Evansville & Terre Haute road.

The Gautier Steel Co., at Johnstown, Pa., expects to start its new works about Sept. 1. The company is a reorganization of a firm formerly doing business in Jersey City.

A report is current that the Grant Locomotive Works, at Paterson, N. J., have secured a contract to build 30 standard-gauge consolidation engines for the Erie.

The Wason Manufacturing Co., at Brightwood, Mass., is building 30 cars for the New York Elevated Railroad, and has contracted to build 10 more with extra finish both inside and out.

#### Bridge Notes.

Wilkins, Post & Co., engineers and bridge-builders at Atlanta, Ga., have just completed one span, combination, 142 ft. 1 in., and one Cushing patent pier at Bayou Connor, Ala., for the Mobile & Montgomery road. This span has been tested and accepted. They have now under construction one wrought-iron span of 153 ft. over Hatchie River on the Memphis & Charleston road; one wrought-iron draw-span of 142 ft. over One-Mile Creek on the Mobile & Montgomery; three combination spans of 66 ft. each over Etowah River on the Cherokee Railroad, and are remodeling one span of 174 ft. over Suwannee River, on the Atlantic and Gulf road.

The King Iron Bridge Co., at Cleveland, O., has been awarded the contract for the new Weir Bridge at Taunton, Mass. It is a highway bridge, of iron, 115 ft. long.

The Keystone Bridge Co., of Pittsburgh, is building some large iron roof trusses for the new stables of the Washington & Georgetown Railroad, at Georgetown, D. C.

LeRoy, Shattuck & Head have received the contracts for the new Whipple wrought-iron truss bridges over the Oriskany Creek at Coleman's mills and at Peckville. The latter will be 130 feet in length and of the same style as that now building by the same firm over the Sauquoit Creek at Clayville. They employ 105 men.—*Utica (N. Y.) Herald*.

The Pacific Bridge Co., of San Francisco, has contracted to build a bridge with double roadway over the Salinas River, at Castroville, Cal. The price is \$19,300, and the bridge is paid for by Monterey County.

Mr. A. Gottlieb has been chosen President of the Keystone Bridge Co., in place of Mr. J. H. Linville, who becomes Consulting Engineer. The Chicago and Philadelphia offices have been abolished, and the business will be concentrated at the Pittsburgh office.

The contract for the superstructure of the Dartmouth street bridge in Boston has been awarded to the Keystone Bridge Co., for \$22,227. Six bids were received.

#### An Excursion Car.

The Springfield Republican says: "A number of Worcester gentlemen have started a novel excursion business, in fitting up a car to be run by themselves and let to others for use on any railroad. They have formed for the purpose a regular corporation, of which Jerome Marble is President. Their car has just been finished. The design of the company is to furnish the car to pleasure parties, for railroad journeys of any length, in which they can live, travel, eat and sleep, independent of hotels. The sleeping accommodations are equal to the best sleeping cars, while the culinary department is complete. The car is 52 feet long, exclusive of the platform, and 9½ feet wide."

This is only what the Pullman Palace Car Company has been doing for many years. It will supply you a cook and a steward with the car, at so much a day, and you can make your own contracts with the railroads, go where you please, stay as long as you please, and eat and sleep on your own premises, independent of hotels and civilization.

#### Government Contracts.

Colonel J. N. Macomb, United States Engineer, will receive bids as follows at his office, No. 1,328 Chestnut street, Philadelphia:

Until Aug. 8 for dredging mud, sand and gravel and removing rock in the Schuylkill River.

Until Aug. 8 for dredging mud and removing fast rock in the harbor of Wilmington, Del.

Until Aug. 5 for completion of a pier of crib and stone work at New Castle, Del.

Lieutenant-Colonel Q. A. Gillmore, United States Engineer, will receive until Aug. 29, at the Army Building, corner Houston and Greene streets, New York, proposals for the construction of a jetty in the harbor of Charleston, S. C. Specifications and forms of bid can be had on application to the offices, as above.

#### Russian Railroad Schools.

A recent issue of a Russian official journal says that there are now in the country eleven "railroad schools," with 90 teachers, where instruction is given in religion, the Russian language, geography, history, mathematics, physics, me-

chanics, railroad engineering, natural sciences, telegraphy, bookkeeping, drawing, orthography, mechanical trades, singing and gymnastics. Last year these schools had 1,200 students, 81 per cent. of whom were between the ages of 13 and 21; the others younger to 10 years and older to 30 years of age. In the eight years since the opening of the first school 4,843 pupils have studied in these establishments. The schools are attached to railroads, which have to pay about \$11 per mile of road for their support.

#### Requirements of Enginemen in Germany.

The instructions recently issued by the German Empire with regard to the qualifications required of men in different branches of railroad service are as follows for locomotive runners (Locomotivführer):

1. Bodily vigor, and especially good sight and hearing.
2. Knowledge of the subjects taught in the common schools, especially reading and writing, the four fundamental rules of arithmetic and fractions both vulgar and decimal, and the ability to prepare written statements in suitable form concerning any occurrence within the sphere of an engineman's duties.
3. A general knowledge of the treatment of the different metals and timbers used in machine construction.
4. A general knowledge of the simple laws of physics, and especially of steam and its effects.
5. A special knowledge of the locomotive and of its separate parts.
6. Also special knowledge of the management of the locomotive while running and when laid up.
7. A knowledge of the rules for road police and operation, of the directions for making up trains, of the signal ordinance, and of the instructions issued for its execution on the road on which he is engaged; also of the instructions for locomotive runners and firemen, for station foremen, conductors, switchmen, track guards, and brakemen, so far as these regulations affect the duties of the locomotive runner.
8. An acquaintance with the line he is to run on.
9. Service for at least one year in a machine shop, and at least one year's apprenticeship in the locomotive service. With regard to engineers who devote themselves to the higher branches of mechanical engineering, the fixing of this time of service is reserved for the administration of the country.

#### The Ramsey Car Hoist.

A trial of the Ramsey car hoist recently put up at Salamanca, N. Y., for the purpose of transferring cars between the Rochester & State Line and the Atlantic & Great Western roads, was made July 17, a number of officers of both roads being present, and is thus referred to by the *Cattaraugus Republican* of that town:

"It consists of a siding depressed into a pit about 20 inches deep, with rails of both gauges centrally located, and on each side a narrow track remaining on the level, bearing light but strong trucks, which run under the sills of the car body and support it while being transferred. Cross bars, resting on the side trucks, are used to support the car bodies. The trucks of a different gauge are run in the depression previous to the arrival of the car, or left there by the car in advance, and by passing the car body over on the side trucks, it becomes disconnected with its trucks at the first incline and connects with the trucks of a different gauge at the opposite incline.

"At the trial yesterday afternoon in the presence of the above-named officials two cars were transferred with satisfactory results. The time occupied was about five minutes each. It is estimated that 15 cars can be transferred an hour, and Mr. Ramsey claims that the speed can be increased to 30."

On a subsequent trial a loaded box-car was transferred from one set of trucks to the other in 1½ minutes.

#### An Improved Tramway.

An improved tramway, invented by Mr. P. Hevner, is at work on the premises of the Messrs. Roebbling, at Trenton, N. J. It differs from other tramways in having the load moved on a suspended track, which is composed of ¾ in. diameter round steel rods, the pulling being done by a small wire rope. The power required is very small, a six-horsepower engine transporting 100 tons of material per hour with ease. The arrangements for turning off at any angle, and returning, are very perfect, and are so arranged that it is almost impossible for anything to become misplaced. Several of the tramways are to be built for use on sugar plantations, also to transport nitrate from the mountains, about 90 miles back from the coast of Peru.—*Coal Trade Journal*.

#### Steam Road-Wagons in Wisconsin.

Several entries had been made for the trial of steam road wagons for the reward of \$10,000 offered by the Wisconsin Legislature, but only two appeared at the appointed time, one from Oshkosh and one from Green Bay. The Green Bay wagon broke down, and after several attempts gave up the contest, being disabled by imperfections in the machinery. The Oshkosh wagon made the trip from Green Bay, by way of Beloit, to Madison, 201 miles, at an average speed of 6 miles an hour, drawing a heavy load over all the grades met. In their report of the test to the Governor, however, the Commissioners, Messrs. Marshall, Olin and Smith, after giving a history of the trip, come to the following conclusions: "The wagon has hauled loads, plowed and otherwise accomplished in a successful manner every test mentioned in the law or suggested by the commission. They are not, however, satisfied that this machine is, in the language and spirit of the law, a cheap and practical substitute for the use of horses and other animals on the highways and farms. As at present constructed, it is unquestionably of great advantage in plowing, thrashing, and hauling heavy machines from one farm to another; for heavy teaming on the highway, etc., but the commission is not prepared to say that a machine requiring an outlay of \$1,000, with a daily expenditure of from \$2 to \$6, is a cheap or practical substitute for farm animals. They recommend that the next Legislature make a suitable award for payment in perfecting a machine, but, under all circumstances, cannot make the award of \$10,000 offered by the Legislature of two years ago."

The Oshkosh wagon, which made the trip successfully, weighs 4,800 lbs. light, or 6,600 lbs. with water and coal for an eight-mile run; it hauled a wagon weighing 3,500 lbs. loaded. Its running time for the 201 miles was 33 hours, and at one point it made 21 miles in two hours and 10 minutes. Its speed was tried on the Oshkosh race-course, where it made a mile in 4 minutes 36 seconds. It was also tried at Fort Atkinson with a gang of plows and did excellent work.

#### One-Rail Roads in South Africa.

The English Government has in use for military purposes in the Trans-Vaal in South Africa a considerable length of single-rail railroads. The road is entirely of timber, carried on posts and with the grades conforming to the surface of the ground. The structure is of a somewhat rough and temporary character, but carries a locomotive and train, and has been very serviceable in a country destitute of roads and bridges. In some places a more permanent line has been put up, with iron deck-beams as the upper rail, but generally the whole structure is of wood.

#### International Congress of Civil Engineering.

There is to be held in Paris from the 5th to the 12th of August a Congress of Civil Engineers, for which an extended programme of exercises, extensive enough to have been drawn up for a convention of the American Society, has been published. The French Congress, however, is to have no less than nine different sections, so that the time devoted to each subject may be considerable after all. The nine sections are: 1. Mining and Metallurgy. 2. Agriculture and Rural Engineering. 3. Machinery. 4. Roads, Rivers and Canals. 5. Railroads. 6. River and Marine Navigation. 7. Public and Private Works (including water supply, sewerage, ventilation, machine drilling and foundations). 8. Industrial Physics and Chemistry. 9. Various Industries. Under the section on "Roads, Rivers and Canals" the following questions are proposed for discussion: 1. Inundations and means of preventing them. 2. New processes of erecting metallic bridges. 3. Utilization of roads and their borders for constructing railroads. 4. Comparison of the different methods of street (pavement) construction in cities. 5. River locks.

The questions proposed in section 5, "Railroads," are as follows: 1. Cheap Railroads.—Gauge of tracks; grades and curves; connections; transfers; results secured. 2. Motor-Engines for Tramways.—Steam, hot water, and compressed air motors; motor-cars and independent motors; coefficients of traction. 3. Material Improvements to be Introduced in Passenger Service.—Cars, their heating; sleeping-cars; communication between cars; baggage service. 4. Improvement of the Roadway.—Substitution of steel for iron rails; metallic cross-ties; switches. 5. Use of Sleep Grades.—Central rail; stationary engines; rope systems; principal results secured; brakes; counter-pressure steam.

#### Death of the First Railroad Clerk.

Last month, ceased to exist, in Chapel street, Birkenhead, W. N. Found, the oldest railway clerk in the world. The deceased booked the first passenger on the Manchester & Liverpool Railway Company. Passengers were then booked at what is now the Royal Hotel, in Dale street, and conveyed in omnibuses to Edgemoor, thence per rail to Manchester. "Daddy Found," as he was familiarly called, will long be remembered for his anecdotes of railway experience in a by-gone age by those who are traveling in his footsteps, and who now mourn his loss. The following brief sketch of his career will not be without interest: Mr. Found joined the Liverpool & Manchester Railway Company in 1830, as booking clerk, at the age of 19, and remained till 1845, the chief of the office being Mr. Andrew Comber. When the amalgamation in 1845 took place, he was appointed Superintendent of the Preston & Wyre Railway, the General Manager being Mr. Braithwaite Poole, well known as the author of "A Railway Clerk's Calculator." In 1847, Mr. Found was appointed chief cashier and accountant at Chester, that town being then the terminus of four companies, i. e., London & North-western, Chester & Holyhead, Shrewsbury & Chester, Lancashire & Cheshire Junction. Mr. Found remained here till 1855, when he became accountant to the Ulverston Hematite Company, the Manager being Mr. Roebuck, formerly Superintendent of the Stour Valley Section, London & North-western. Again, in 1861, Mr. Found joined the audit office of the London & North-western office at Birkenhead, and remained till within a few months of his death. A movement is now in course of formation for raising a fund on behalf of the widow, an old lady of 70 years of age, who is left to the benevolence of friends. Any further particulars may be obtained from Mr. James Barr, London & North-western Railway, Birkenhead.—*Railway Service Gazette*.

#### Another Traveling Bird.

A correspondent of the *Times* records the following interesting fact, which is placed under the heading of "A Season Ticket:—" "Last year," he says, "a water wag-tail built her nest on the framework underneath a third-class carriage on the London & South-western Railway, running between Cosham and Havant four times daily, about 40 miles in all, and the male bird was regularly observed by the station-master waiting with manifest interest and anxiety the return of his family from their periodical tours. This year the same bird, we believe, has returned, and built her nest in precisely the same position, under a third-class carriage, and, with her family of four little ones, taking the same daily return journeys from Cosham to Havant."

#### Glasgow Bridge over the Missouri.

The contract for the new bridge of the Chicago & Alton Railroad over the Missouri River at Glasgow, has just been awarded to the American Bridge Company, of Chicago. Gen. Sooy Smith is the engineer of the bridge, the whole of which is to be made of steel. It will be the first example in this country of a truss bridge made entirely of that material. It will be a single-track bridge of five spans of 315 ft. each, which are to be Pratt trusses with pin connections. The competition for the contract was narrowed down to the Keystone, Baltimore, Delaware and American bridge companies, and all their bids were very close.

The timber caissons for piers are now being laid by the pneumatic process, the sand and dirt being discharged by steam ejectors, which are, we are told, working very successfully.

#### OLD AND NEW ROADS.

**Alabama Great Southern.**—A Mobile dispatch of July 29 says: "Mr. Fred. Wolfe, Financial Manager of the Alabama Great Southern Railroad, settled yesterday to the full amount due by John Swann, purchaser of the Alabama & Chattanooga Railroad, in accordance with the decrees of the court."

**Atlantic & Audubon.**—The contract for grading this new branch of the Chicago, Rock Island & Pacific road has been let to J. J. Brown, of Council Bluffs, Ia. The road will extend from Atlantic, Ia., north to Audubon, about 24 miles.

**Atchison, Topeka & Santa Fe.**—The track on the Southern Extension is now down to a point 22 miles southwest from the junction with the main line at La Junta, Col. Work is progressing rapidly toward Trinidad.

**Boston, Hoosac Tunnel & Western.**—The bridge over the Hudson River at Mechanicsville, N. Y., is completed. It cost, with the approaches, about \$250,000, and is the most important work on the new road. Work is progressing well on the grading east of the bridge.

**Brattleboro & White Hall.**—This road is now surveyed and located from Brattleboro, Vt., to South Londonderry, 35 miles, which is all that the company expects to build at present. Profiles and specifications will be ready about Aug. 15, after which the company expects to receive bids for building the road.

**Buffalo, Corry & Pittsburgh.**—It is reported that A. H. Barney, the purchaser of this road for the foreclosure sale, has sold it for \$75,000 to Mr. Buttman, of Boston, who represents the Boston Refining Company. It is said that the new owners will put trains upon the road at once, and that they will put the road in good order. It was formerly worked by the Allegheny Valley Company, but was sold at foreclosure sale April 19, and a month ago trains were with-



drawn. It extends from Corry, Pa., to Brocton, N. Y., 43 miles.

**Cannon Valley.**—This projected road is to run from Red Wing, Minn., on the Mississippi, westward up the Cannon River through Northfield and Faribault to Mankato, about 100 miles. The company is now trying to secure aid from the Minneapolis & St. Louis Company, and from the merchants of Minneapolis.

**Chester & Lenoir.**—Dr. A. H. Davega, of Chester, S. C., formerly President of this company, has begun proceedings to enforce a judgment for \$8,000 held by him, and asks for the appointment of a receiver. Officers of the company claim that it is entirely solvent, and say that the matter will be settled.

Sufficient stock has been subscribed in Caldwell County, N. C., to pay for the grading in that county, and a force has been put at work. The grade was last week completed from Lincoln, N. C., to Newton. From Newton, northwest to Lenoir the grade was partly finished some time ago, leaving about 10 miles to be done, and the work on this section has just been begun.

**Chicago, Burlington & Quincy.**—This company is reported to have closed a contract for about 20,000 tons of steel rails at \$44 per ton in Chicago. The order is divided between the North Chicago and the Cleveland mills. This is a very large order for a completed road in a good state of maintenance, such as the Chicago, Burlington & Quincy always has been. It has about 1,984 miles of track, partly of 60 lbs., but mostly of 56 lbs. rails, of which 575 miles were steel at the beginning of this year. The 20,000 tons now purchased, of 56 lbs. rails, would be sufficient to renew nearly one-sixth of all the iron in the track, or 227 miles, or 212 miles if they are 60 lbs. rails. The company heretofore has not laid more than 108 miles in any one year. It has put in 360 miles within the last four years.

**Chicago, Danville & Vincennes.**—In the United States Circuit Court at Chicago, Alanson S. Dunham, Receiver of the remaining assets of this company (whose road has been sold under foreclosure and is now owned by the Chicago & Eastern Illinois Company), filed a petition to compel a conveyance of certain lands donated to the company when the road was under construction. The petition charges that these lands were conveyed to Wm. D. Judson, Amos Tenney and others, officers and agents of the company, and that they have retained the titles themselves, instead of conveying them to the company. An order compelling a transfer and accounting is now asked for.

**Cincinnati Southern.**—The trustees have decided to accept the bid of R. G. Huston & Co. to finish the road from Somerset to Boyce's, near Chattanooga, with 34 iron and 12 wooden bridges. This bid is for \$1,672,000, work to be done by Aug. 20, 1879, under penalty of \$1,000 per day for any delay beyond that time. Huston & Co. have signified their acceptance of the conditions and their readiness to begin work.

According to the terms of the law providing for the completion of the road, the trustees have formally notified the Mayor of Cincinnati of this action, and an election will be held to see if the people will approve of a further city loan of \$2,000,000 to complete the road.

**Denver & Rio Grande.**—The following figures for June and the six months ending June 30 are from the report of R. F. Weitbrecht, Treasurer:

	June.	Six months.
Freight.....	\$59,642.89	\$305,290.86
Passengers, mails and express.....	30,214.44	130,615.68
Miscellaneous.....	492.50	1,713.02
Total.....	\$90,349.83	\$437,619.56
Expenses.....	52,964.39	271,779.18
Net earnings.....	\$37,385.44	\$165,840.38
Per cent. of expenses.....	58.62	62.05

Earnings from mails and other Government business in June were \$2,728.11. As compared with June, 1877, there was an increase of \$32,848.22, or 57 per cent., in gross, and of \$12,581.49, or 50.8 per cent., in net earnings.

The Denver (Col.) News of July 25, giving the Denver & Rio Grande view, says: "By agreement of counsel in the case of the Denver & Rio Grande against the Atchison, Topeka & Santa Fe, and others, the duplicate copy of the original map, approved by the Secretary of the Interior, and offered in evidence by the defense, was yesterday admitted, and the oral evidence to sustain the identity of the drawing, and other claims of compliance with the congressional enactment under which the Canon City & San Juan Company is alleged to have organized, was avoided. The case was then continued to the first week in August, at which time the rebutting testimony of Gen. W. J. Palmer will be taken, and the cause argued and submitted.

"We will not undertake to foreshadow the decision of the Court in this matter. The complainant set out to prove that the Atchison, Topeka & Santa Fe, and not the Canon City & San Juan Company, are the real aggressors against their rights, and enough of the evidence has been given to show the reader the extent to which this point has been proven. The case, as it now stands, may be thus briefly summarized: A favorable decision for the Denver & Rio Grande Company will prevent the Atchison, Topeka & Santa Fe from building through the cañon at all, for if the evidence which has been submitted is considered by the Court as a substantiation of the allegations of the amended bill of complaint, the decision, as we understand it, will give the Denver & Rio Grande Company an absolute grant of the 200 feet width through this most marvelous of mountain gorges. Judge Dillon, in his opinion (rendered in June) overruling the defendant's demurrer to the amended bill of complaint, used this language:

"If a center line be drawn through the cañon, one company should be restricted to the space on one side of that line and the other on the other side of that line, if this will allow of the construction of the two lines of railway in the cañon, and no other course is more equitable. If both companies are ready to go forward to construct their roads immediately, one company should not be permitted to adopt a route which will prevent the other company from an equal and reasonable use of the cañon. Equality is equity."

"It would seem, therefore, that if the present cause is decided in favor of the 'banana line'—which is by no means indicated by the character of the evidence submitted—that road will have to share the cañon with the Denver and Rio Grande, the latter road having two chances in the contest to the former's one. The Atchison, Topeka & Santa Fe seems to understand this fact, since they have not availed themselves of the temporary dissolution of the injunction against them in June, knowing that, in the event of defeat in the final hearing, any work done by them in the cañon would be confiscated by the Denver & Rio Grande."

**Detroit & Milwaukee.**—The Detroit Post and Tribune of July 25 says: "The Receiver of the Detroit & Milwaukee Railroad yesterday applied to the Wayne Circuit Court for authority to purchase 1,000 tons of steel rails, and it was granted. The purpose is to complete the line with steel track, and the quantity called for will finish the job. The railway will then be in first-class condition from Detroit to Lake Michigan.

"The Detroit & Milwaukee Railroad Company yesterday

filed a petition in the Circuit Court, asking for the appointment of a trustee, to fill the vacancy caused by the death of A. H. Sibley. The original trustees of the first mortgage bonds have all died, and in their places were appointed A. H. Sibley, of Detroit; Henry Ledyard, of Newport, R. I.; and Donald McInnis, of Hamilton, Ont. By the terms of the mortgage, any court of competent jurisdiction is authorized to fill vacancies in the list of trustees. An interesting question has arisen on the appeal to the Supreme Court from the decree of foreclosure, and order of sale of the Wayne Circuit. Mr. Sibley had given notice of an appeal, but his bond had not been perfected before his death. Now an application has been made to the Court to have the case go on in the name of his successor, and this is yet undecided. The matter of the bond is also in controversy, it being claimed that since the principal is dead the bond is good for nothing. This matter is to be further aired before Commissioner Hibbard next week."

**Freehold & New York.**—This company has executed a mortgage to J. N. Whiting, Trustee, to secure an issue of \$100,000 bonds. The proceeds of the bonds are to be used to pay off existing debts and to build docks on Raritan Bay at Keyport. The road was built last year from Freehold, N. J., north to Keyport, 14 miles.

**Houston, East & West Texas.**—A contract has been let to Mr. Snelling, of Houston, Tex., for an extension of 15 miles of this road, which will carry it nearly to Swartwout, on the Trinity, about 50 miles from Houston. The grading on this section will be light. The bridge over East River is nearly finished.

**Houston & Texas Central.**—It is stated that this company has ordered surveys made for a branch to Belton, Tex. Two lines will be run; one from Brenham and one from Waco. The object is to secure possession of the territory, and, if possible, to prevent the extension of the Gulf, Colorado & Santa Fe to Belton.

**Kansas Pacific.**—A circular has been issued by D. M. Edgerton, Acting President, charging the Denver Extension Bondholders' Committee with misrepresenting the former agreement with the Union Pacific pool, and with an attempt to break it in order to secure some advantages for individual members of the committee. The circular claims that the committee did agree that all the Denver Extension bonds should be deposited, and that they afterward tried to draw out of the agreement and finally refused to carry it out. He claims that the members of the pool have been willing to carry out their contracts in good faith, and only desire to harmonize all the conflicting interests in the road.

**Lafayette Pool.**—All through business east from Lafayette, Ind., is now pooled, the managers of the Indianapolis, Cincinnati & Lafayette, the Lafayette, Muncie & Bloomington, the Wabash, and the Louisville, New Albany & Chicago roads having entered into such an agreement, the pool to be in force 90 days, with the understanding that it will be continued if the pool works satisfactorily to all parties interested.

**Lake View & Collamer.**—This road was recently sold to Wm. E. Lewis, of Cleveland, O., under foreclosure of mortgage. A new company has been organized called the Cleveland, Painesville & Chardon Railroad Company. The capital stock is \$10,000, and no mortgage debt is to be allowed, and no debt of any kind contracted except to the stockholders, who will advance the money needed. The road now extends from Cleveland to Euclid, 10 miles, but the new company is arranging for an extension of eight miles to Willoughby, to be followed by nine miles more, to Painesville. It will run about a mile and a half south of the Lake Shore road, along what is known as the South Ridge or old buffalo trail.

**Manchester & Keene.**—This company has finally decided to accept the proposition made by the Cheshire Railroad Company, and to make its crossing of that road at Keene, N. H., overhead instead of at grade. The Cheshire Company agrees to pay \$8,000 toward the additional expense caused by the overhead crossing.

A contract for completing the western end of this road, including the crossing over the Cheshire road at Keene, N. H., has been let to Mr. Arms, of Stafford, Conn., the work to be done by Nov. 15.

**Marshall & Sabine Pass.**—It is proposed to build a narrow-gauge road from Marshall, Tex., south by way of Carthage and the Neches Valley to Sabine Pass, a distance of some 220 miles. A company is to be organized at once.

**Maryland & Delaware.**—The bondholders, who bought this road at foreclosure sale, have made arrangements to organize a new company to be known as the Delaware & Chesapeake Railroad Company.

**Massachusetts Central.**—The representatives of the towns and other stockholders have selected Ex-Gov. Thomas Talbot as trustee, to whom all the stock is to be transferred. He is to hold it for two years, and if the road is then finished and equipped from Northampton to Stony Brook, he is to return one-fourth to the present holders and to transfer the other three-fourths to the parties who have agreed to finish the road. If it is not completed as agreed, all the stock is to be returned to the present holders.

**Minnesota Valley.**—The track is now laid on this road from Sleepy Eye Lake, Minn., on the Winona & St. Peter, northwest up the Minnesota River to Redwood Falls, 26 miles. Col. De Graff, of St. Paul, is contractor for the road. It will soon be opened for business, and will be worked as a branch of the Winona & St. Peter.

**Nebraska City, Taber & Botna Valley.**—A company has been organized to build a road from the Chicago, Rock Island & Pacific near Atlantic, Ia., south by west down the Nishnabotna River to East Nebraska City, a distance of about 65 miles, for about half of which it would be close to the Nebraska City Branch of the Chicago, Burlington & Quincy. The projectors will ask for subscriptions along the line and for some aid from the Rock Island Company.

**Nashua & Lowell.**—The Lowell (Mass.) Courier says: "It is generally understood that the directors of the Boston & Lowell Railroad Company have made a definite proposition, subject to the ratification of the stockholders, of the terms on which they will take a lease of the Nashua & Lowell Railroad for a long term of years. The offer is 6 1/2 per cent. on the capital stock, free of taxes, the purchase of some of its outside property, assuring its leases, etc. This proposition has been rejected by a majority of the directors of the latter road, and preparations are soon to be made to run each road separately at the expiration of the present joint contract in October. It is said that some of the Nashua & Lowell directors are very anxious to try this experiment, while others are very doubtful of the results.

"With roads so intimately connected together in business, and after the experiences of a joint operation for over twenty years, separate operation is considered by many a bold experiment at this time. It has not yet received the sanction of the stockholders of the Nashua & Lowell, and is said to be a step taken by the directors without their advice. The attitude of the Nashua & Lowell directors toward the Boston &

Lowell seems to preclude further joint operation, and if a lease fails, separation is unavoidable."

**Nashville, Chattanooga & St. Louis.**—A branch is to be built from Whiteside, Tenn., to some coal mines about three miles distant. The mines have recently been bought by Memphis parties who intend to work them extensively.

**New York & Manhattan Beach.**—This company has completed a branch from Manhattan Beach on Coney Island, N. Y., eastward along the shore of the island to its eastern end. It is two miles long and excursion trains are run over it for the benefit of visitors to the beach.

**New York, Pittsburgh & Western.**—Parties connected with this projected road are working up subscriptions along the line in Ohio, and have secured some aid. It is to be a narrow-gauge road, and is to run from Pittsburgh to Youngstown over the line of the projected Pittsburgh, New Castle & Lake Erie, and from Youngstown nearly due west to the Indiana line.

**Northern Pacific.**—It is reported that arrangements will soon be made for putting under contract 200 miles of the main line from Bismarck, Dakota, west to the Yellowstone.

Surveys have been completed for the proposed branch from a point near Fargo through the Red River valley to Pembina. The distance is 152 miles, and the estimated cost is \$945,000, which appears very small; possibly there is a mistake in the figures reported. This line would be parallel with and but a few miles from that of the St. Paul & Pacific Company, now well advanced toward completion.

A report comes by way of Ottawa, however, that this company and the St. Paul & Pacific have settled their differences and have made arrangements for a joint line to Pembina and a connection there with the Canadian Pacific branch line to Winnipeg.

**Pemberton & New York.**—Receiver Bucklew took formal possession of this road Aug. 1. It is understood that it will be worked under his direction in connection with the Amboy Division of the Pennsylvania Railroad. It extends from Pemberton, N. J., to Whiting Junction, 18 miles, and has been worked by the New Jersey Southern.

**Pennsylvania.**—The Altoona Sun of July 27 says: "The Pennsylvania Railroad Company have tendered their old locomotive engineers, such as Andrew Purcell, James Westfall, Henry Cassidy, and a whole host whose names will suggest themselves to railroad men, and the wives of the same, a grand excursion to New York, Cape May, a trip up the Hudson, and return to Watkins Glen, Niagara Falls, etc., and all the expense to be paid by the corporation. It is designed to organize the expedition about the middle of September, and of course the treat will be a rare one for the faithful employees who have been true to the interest of the company through years. The old engineers will enjoy a week or two of recreation, and it is a graceful act on the part of the corporation to afford them this opportunity to get off from their arduous duties for a brief spell."

**Philadelphia & Reading.**—This company's statement for June and the seven months of its fiscal year ending June 30 is as follows:

	June.		Seven Months.	
Gross Receipts:	1878.	1877.	1878.	1877.
Railroad traffic.....	\$1,207,874	\$1,027,314	\$6,231,509	\$5,379,870
Canal traffic.....	179,742	115,359	981,133	406,070
Stream colliers.....	42,329	43,801	318,000	396,350
Richmond barges.....	8,714	12,984	43,720	57,528
Total R. R. Co.....	\$1,438,659	\$1,199,518	\$6,974,431	\$7,239,807
Coal & Iron Co....	920,506	898,217	3,882,190	4,070,844
Total.....	\$2,419,165	\$2,097,735	\$10,856,620	\$11,910,651
Traffic:				
Passengers.....	589,975	587,290	3,568,306	3,092,276
Tons merchandise.....	253,552	279,538	1,825,025	1,759,504
Tons coal on colls.....	754,653	670,911	2,958,061	3,614,893
Tons coal mined.....	51,416	48,895	319,023	315,308
Coal & Iron Co.....	333,193	375,710	1,377,003	1,764,128
Tenants.....	147,506	108,761	540,038	678,514
Total.....	\$480,609	\$484,471	\$1,923,041	\$2,442,942

The earnings of the railroad company show an increase of \$299,141, or 19.1 per cent., for June, and a decrease of \$265,376, or 8.7 per cent., for the seven months.

**Pittsburgh, Virginia & Charleston.**—This company has secured the amount of subscriptions needed for the extension from Monongahela City, Pa., up the Monongahela River, 23 miles to Brownsville. Arrangements are now being made for the right of way.

**Portland & Ogdensburg, Vermont Division.**—A cross-bill has been filed in the foreclosure suit by Capen, Sprague & Co., of Boston, and the Court has made an order giving creditors until Oct. 1 to file their liens and claims for examination.

The company has petitioned the Vermont Supreme Court for a mandamus to compel the town of Fairfield to issue the bonds voted in aid of the road. The case is set for hearing at the October term.

**Portsmouth, Great Falls & Conway.**—A meeting of bondholders resident in Maine and New Hampshire was held in Portsmouth, N. H., July 24, and a committee of five appointed to see what could be done to protect the interest of bondholders in the property. The committee consists of A. K. Shurtleff, David H. Buffum, M. J. Burleigh and Ezra H. Winchester. It was instructed to act in concert with the committee to be appointed by the Boston bondholders.

A meeting of the bondholders was held in Boston, July 25, at which a statement was submitted showing that the Eastern Company, which holds a controlling interest in the stock, purposes putting this company into voluntary bankruptcy. The company owes only \$14,000 besides its bonded debt, and the earnings were said to be sufficient to pay interest. The bondholders agreed to appoint J. W. Converse, W. B. Howe, J. W. Emery, and Seth J. Thomas a committee to represent their interests, and to pay an assessment of 1 per cent. to meet the expenses of such legal proceedings as may be necessary. The committee was also instructed to try and secure an equitable settlement by compromise if possible.

At the stockholders' special meeting in Portsmouth, N. H., July 30, it was stated that the matured and maturing debt of the company is \$2,414,896. No action was taken on the question of putting the company into bankruptcy, the whole matter being postponed until Aug. 14, to which time the meeting was adjourned.

**Rochester & Northern Minnesota.**—Work on this road is progressing steadily and the rails are down from the junction with the Winona & St. Peter at Rochester, Minn., northward to New Haven, about 10 miles.

**Rockford Central.**—In the United States Circuit Court, in Chicago, James R. Young has filed a bill against this company and others. The road was intended to run from Mendota, Ill., through Rockford to Beloit, Wis., 74 miles, and in 1871 some 24 miles of it were graded, and a bridge over



Rock River built by Young and others as contractors. For this work there is still a balance of about \$90,000 due them, and the company has been wholly insolvent for years. The present suit is brought to compel an assessment upon the subscribers to the stock in order that the balance due the contractors may be paid.

**St. Paul & Pacific.**—Track on the extension of the Branch Line is now laid to Sauk Centre, Minn., eight miles west by north from the late terminus at Melrose, and 116 miles from St. Paul. Work is being pushed on the line to Alexandria.

**Southern Minnesota.**—The La Crosse (Wis.) *Republican* of July 25 says: "The ties for the proposed extension of the Southern Minnesota Railway from Fairmont to Jackson have nearly all been received from the Wisconsin Valley road and the work will go on as fast as possible. It is probable that the line will be pushed westward another 25 miles to Pipestone Quarries and to a connection with the Sioux City road this fall. The telegraph line was completed and put in operation to Fairmont on Tuesday."

**Spencer.**—Eight gangs of men are now at work on the grading of this new road. It is to run from Spencer, Mass., to Spencer Station on the Boston & Albany, about three miles.

**Springville & Sardinia.**—The contract for the grading and bridging of this road has been let to Napier Brothers, of Machias, N. Y., for \$1,890 per mile. The line is from Springville, Erie County, N. Y., east by north to the Buffalo, New York & Philadelphia in the town of Sardinia, about 13 miles.

**Syracuse, Geneva & Corning.**—The extension of this road from Geneva, N. Y., northward to Lyons, 13 miles, is completed and was transferred to the company on July 27 by the contractor, George H. Thompson, of Rochester. This extension connects the Auburn Branch and the main line of the New York Central, and will probably be worked by that company, which controls the Syracuse, Geneva & Corning.

**Union Pacific.**—At the office in Boston, last week, 141 of the outstanding sinking-fund bonds were drawn for redemption, in pursuance of the terms of the mortgage. The numbers drawn were as follows: 43, 146, 208, 297, 316, 367, 684, 736, 933, 996, 1209, 1358, 1403, 1412, 1675, 1709, 1799, 1966, 1970, 2053, 2223, 2536, 2625, 3032, 3081, 3100, 3143, 3193, 3203, 3216, 3217, 3233, 3676, 3963, 3969, 4035, 4067, 4078, 4202, 4288, 4433, 4515, 4547, 4698, 4710, 4713, 4740, 5012, 5024, 5190, 5430, 5440, 5454, 5503, 5524, 5551, 5689, 5794, 5805, 5901, 6000, 6038, 6232, 6306, 6404, 6406, 6503, 6516, 6531, 6590, 6609, 6796, 6879, 6967, 7087, 7126, 7707, 7902, 7941, 8007, 8214, 8268, 8428, 8697, 8743, 8752, 8763, 8890, 9162, 9226, 9497, 9796, 9830, 10011, 10027, 10029, 10040, 10267, 10414, 10673, 10725, 10754, 10864, 10970, 11151, 11229, 11249, 11360, 11593, 11685, 11711, 11955, 12201, 12353, 12369, 12544, 12815, 12821, 12836, 12859, 12924, 13014, 13092, 13110, 13184, 13317, 13439, 13455, 13462, 13472, 13480, 13518, 13535, 13582, 13664, 14036, 14509, 14665, 14764.

Holders of the bonds so drawn are required to give notice in writing to the Union Trust Company, of New York, Trustee, on or before Sept. 1, 1878, of their election to have said bonds redeemed, failing which such bonds shall cease to be entitled to the benefit of the sinking fund.

A dispatch from Omaha says: "Several filings having been made on Union Pacific lands since Secretary Schurz's decision concerning Pacific railroad land grants, Leavitt Burnham, the Union Pacific Land Commissioner, issued a circular to-day, announcing that each and every case where such interference is attempted will be litigated to the court of last resort."

**Western, of North Carolina.**—Two lines have been surveyed for the extension of this road from Egypt, N. C., to Greensboro. One is nearly straight, the other makes a detour to the factories on Deep River, is eight miles longer than the direct route, and its estimated cost is \$100,000 greater. It would, however, command some traffic not reached by the shorter line. At a recent meeting of the board held to decide upon the location, it was resolved to postpone the matter for the present, to see if the parties interested in the longer line are willing to contribute to the increased cost.

**Wheeling & Lake Erie.**—A meeting was to be held in Hopedale, O., Aug. 1, for the purpose of making arrangements to secure the appointment of a receiver. The company is hopelessly insolvent, and the stockholders want to wind up its affairs to relieve themselves of further responsibility.

## ANNUAL REPORTS.

### Kansas City, St. Joseph & Council Bluffs.

This company works a line from Kansas City, Mo., to Council Bluffs, Ia., 198 miles; a branch from Amazonia, Mo., to Hopkins, 50 miles, and 4 miles of short branches and connections, making 252 miles in all. Its report is for the year ending Dec. 31.

The equipment consists of 31 engines; 18 passenger and 11 baggage cars; 775 freight and 128 service cars.

During the year the company was in process of reorganization under an agreement to substitute \$5,000,000 bonds and \$2,500,000 preferred stock for the former funded debt of \$7,481,970, reducing the annual interest charge from \$620,860 to \$350,000.

The work done was as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Train mileage.....	386,141	302,885	L.	183.256
Passenger mileage.....	11,800,946	11,400,003	L.	340,941
Tonnage mileage.....	38,544,342	33,338,212	L.	3,206,130

Average rate:

Per passenger per mile.....	3.63 cts.	3.71 cts.	D.	0.08 ct.	2.2
Per ton per mile.....	2.32 "	2.15 "	L.	0.17 "	7.9

The earnings for the year were as follows:

Total .....	\$1,423,797.06	\$1,241,929.27	L.	\$182,467.79	14.7
Expenses, .....	979,533.06	908,117.32	L.	71,415.74	8.0
Net earn.	\$444,264.00	\$333,211.95	L.	\$111,052.05	33.3

Total.....	\$1,423,707.06	\$1,241,329.27	L.	\$182,377.79	14.7
Expenses.....	979,533.06	908,117.32	L.	71,415.74	8.0
Net earn.....	\$444,174.00	\$333,211.95	L.	\$110,962.05	33.3

Gross earn. per mile.....	5.640.90	4.925.91	L.	724.98	14.7
Net earn. per mile.....	1.733.27	1.295.22	L.	438.05	33.3
Per cent. of exps.....	60.50	73.71	D.	4.21	5.7

Expenses include all renewals and track rentals paid. Interest paid, including some accrued during the previous year, was \$367,265.50, leaving a balance of \$76,998.50, which was chiefly used in buying new equipment. The increase in expenses was due principally to increased renewals.

In order to provide for increased business 3 engines and 100 box cars were bought. Some permanent improvements to the road were made, the whole amount added to construction account for new construction and equipment being

\$118,515. The floating debt at the close of the year was as follows:

Pay-rolls, open accounts, etc.....	\$109,589
Notes payable.....	127,775
Accrued interest.....	174,881
Total.....	\$409,245
Less assets, cash, materials, balances due.....	338,754
Balance of liabilities.....	\$140,491

It is stated that the policy of the board in incurring this floating debt has secured large additional business which otherwise would have sought other channels.

### Atlanta & West Point.

This company works a line 87 miles long, from Atlanta, Ga., to West Point, of which it owns 81 miles, from East Point to West Point, and leases 6 miles, from East Point to Atlanta, from the Central Railroad of Georgia. Its report is for the year ending June 30.

The equipment consists of 19 engines; 5 passenger, 4 baggage and 1 express car; 113 box, 18 stock, 23 platform, 8 coal and 5 caboose cars. Two old engines were broken up during the year.

The company has a very light capital account, the stock and bonds being as follows:

Stock (\$15.212 per mile).....	\$1,232,300
Bonds (\$1.025 per mile).....	83,000
Total (\$16.237 per mile).....	\$1,315,300

The freight business for the year was as follows:

The freight business for the year was as follows:				
	1877-78	1876-77.	Inc. or Dec.	P. c.
Bales local cotton.....	45,778	43,626	L. 2,152	4.9
Bales through cotton.....	24,725	55,471	D. 30,746	55.4

The loss in through cotton was due chiefly to competition on shipments from Selma and Montgomery. Local cotton promises to show a further increase this year. Of the passenger business Superintendent Grant says: "The passenger

business shows some reaction from the decline of past years. The increase of through travel over the previous year is 17 per cent. in number of passengers, and 18 per cent. in revenue; and, of way travel, 15 per cent. in number and 13 per cent. in revenue. The former is, in part, due to closer Texas connections; and the latter, in part, to the State fair last October; but I think the increase of both may in some measure, be fairly attributed to the improving pecuniary condition of the agricultural class of our people."

The earnings for the year were as follows:

	1877-78.	1876-77.	Inc. or Dec.	P. c.
Passengers.....	\$100,828.34	\$88,101.13	L. \$12,727.21	14.5
Freight.....	193,517.83	193,481.71	L. 36.12	
Express and mail.....	19,421.90	18,883.56	L. 538.34	2.8
Miscellaneous.....	7,372.49	10,692.42	D. 3,319.93	31.0
Total.....	\$321,140.56	\$311,158.82	L. \$9,981.74	3.2
Expenses.....	175,705.16	176,208.98	D. 503.82	0.3

Net earnings.....	\$145,435.40	\$134,949.84	L.	\$10,485.56	7.8
Gross earn. per mile.....	3,601.27	3,576.54	L.	24.73	3.2
Net.....	1,671.07	1,551.15	L.	120.92	7.8
Per cent. of expenses.....	54.71	50.63	D.	1.92	3.4

Payments from net earnings were as follows:

Net earnings.....	\$145,435.40
Rentals of Central and Georgia track.....	\$6,000
New rails over annual wear.....	17,000
New freight depot and track in Atlanta.....	9,000
Surplus.....	\$113,435.40

From this surplus all interest was paid, and two semi-annual dividends of 4 per cent. each paid to stockholders.

The track has now been renewed, in great part, with steel, leaving only 10 miles of the old light rails in use, and these will be replaced during the current year. The fencing already put up has made a large saving in the expense for stock killed, and the fencing of the whole road is recommended. The new freight house in Atlanta has long been needed, and there has already been a saving in the cost of handling freight there.

## LOCOMOTIVE RETURNS, APRIL, 1878.

Master Mechanics of all American railroads are invited to send us their monthly returns for this table.

NAME OF ROAD.	Number of Locomotives in service.	Number of miles operated.	MILEAGE.		No. MILES RUN TO				Average No. of freight cars hauled.	Average cost per freight car per mile, cents.	COST PER MILE IN CENTS FOR							AVERAGE COST OF	
			Total.	Average per Engine.	Ton of Coal.	Cord of Wood.	Pits of Oil.	Repairs.			Fuel.	Stores.	Miscellaneous.	Engineers, firemen and wipers.	Total.	Coal per ton.	Wood per cord.		
Allegheny Val., River Div.*	130	38	83,257	2,191.40	81	27.02	23.80	0.878	7.61	3.35	0.45	6.31	17.72						
Low Gr'd Div.*	130	20	31,597	1,580.32	22	20.08	19.40	1.181	7.01	3.73	0.62	6.17	17.53						
Atlantic & Great Western, 1st & 2d Divs.	228	83	170,305	2,032.47	66	17.44	16.00		4.27	4.33	0.45	5.98	15.87	1.92	2.84				
3d & 4th Divs.	197	49	126,174	2,575.36	74	21.59	15.50		4.29	4.73	0.36	5.49	15.52	1.62	2.84				
Mahoning Div.	88	32	97,180	1,869.46	19	21.34	17.50		4.95	4.41	0.40	5.75	16.04	1.90	2.84				
Atlantic & Gulf.	343	11	66,764	3,179.43	39	19.22	14.50		3.30	2.95	0.46	6.47	13.18		1.76				
Calo & Vincennes	157	11	23,557	1,364.43	60	14.50			5.13	2.72	0.37	5.37	13.59	1.15					
California Pacific	152	10	23,338	2,336.34	38	17.57			3.94	12.85	0.48	8.18	25.93	6.00	5.75				
Camden & Atlantic	67	13	19,478	1,498.50	40	13.45			5.91	5.86	0.77	4.86	17.40	3.50					
Cen. Pac., Western Div.*	227	59	141,344	2,396.41	70	16.86			7.96	14.61	0.50	6.92	7.73	31.42	6.00	5.75			
Visalia Div.*	157	9	22,948	2,550.49	11	15.39			6.13	12.37	0.51	6.96	26.63	6.00	5.75				
Tulare Div.*	171	12	29,345	2,445.45	17	12.12			4.49	13.48	0.66	0.17	7.63	26.43	6.00	5.75			
Los Angeles, San Diego, Yuma & Wilmington Divs.*	408	18	50,541	2,808.51	93	16.11			4.45	11.73	0.49	0.06	7.26	23.99	6.00	5.75			
Sacramento Div.*	120	34	72,689	2,138.44	37	16.15			7.11	21.03	0.51	0.40	9.28	38.33		5.75			
Oregon Div.*	152	6	17,746	2,958.44	40	21.75			4.13	15.17	0.39	0.28	8.37	28.34	6.00	5.75			
Truckee Div.*	205	26	62,802	2,415.35	43	16.90			5.93	18.37	0.47	0.51	8.65	33.93	6.00	5.75			
Humboldt Div.*	201	19	48,096	2,531.37	37	21.73			8.82	16.27	0.38	0.41	7.68	33.56	6.00	5.75			
Salt Lake Div.*	219	27	70,636	2,616.35	15	18.58			6.11	18.28	0.50	0.52	7.49	32.60	6.00	5.75			
Cleve., Col., Cin. & Ind., Columbus Div.	138	59	163,242	2,767.45	85	30.97			2.56	3.72	0.46	0.61	5.60	12.95	1.55	2.75			
Indianapolis Div.	203	64	104,877	2,044.39	42	24.00			3.39	5.20	0.55	0.94	5.73	15.81	1.75	3.50			
Cincinnati Div.	130	33	75,402	2,285.44	60	21.75			3.84	4.30	0.58	0.98	5.90	15.60	1.75	3.50			
Cleveland & Mahoning Valley.	41	6	13,357	2,226.52	17	23.90	8.70		0.90	3.48	0.27	1.28	6.09	12.02	1.64	2.64			
Cleveland & Pittsburgh*	225	77	155,004	2,030.49	17	19.20	17.30	0.835	3.03	2.72	0.45	2.58	6.36	15.14	1.70	3.28			
Del., Lackawanna & Western, Bloomsburg Div.*	80	20	41,569	2,078.44	...	30.93			3.73	...	0.62		5.14	9.49					
Erie & Pittsburgh*	98	29	63,115	2,176.40	35	18.91	18.00	0.793	2.39	4.11	0.49	1.83	6.61	15.43	1.65	1.65			
Green Bay & Minnesota	240	15	25,082	1,672.44	...	15.06			4.32	8.01	0.69		5.11	18.63		2.50			
Houston & Texas Central.	489	59	138,300	2,344.53	39	30.50	15.10		3.79	7.07	0.55	0.89	6.74	19.08	3.50	3.40			
Ill. Cen., Chicago Div.*	253	37	125,558	2,203.36	93	15.40	19.57		1.59	5.17	0.30		6.01	13.07	1.75	4.20			
South Div.	231	28	68,594	2,450.42	71	13.33	15.32		5.03	4.38	0.34		5.72	15.48	1.75	4.20			
North Div.	225	35	76,372	2,182.55	77	13.16	15.43		7.46	5.21	0.34		5.90	18.91	1.75	4.20			
Springfield Div.	113	10	18,318	1,832.50	65	14.67	11.66		5.89	3.18	0.32		5.63	15.03	1.45	2.65			
Iowa Div.	401	46	97,123	2,111.32	18	15.82	11.94		6.12	8.34	0.31		5.96	20.78	2.60	4.90			
Jeff.ville, Madison & Ind.*	226	42	89,367	2,128.47	44	13.36	18.59	1.200	5.82	13.65	0.41	2.39	6.80	26.98	3.62	4.01			
Kansas City, St. Jo. & Council Bluffs*	271	31	109,924	3,320.46	20	27.30	18.20		3.80	6.00	0.30		6.50	16.60	2.65	3.50			
Lake Shore & Mich. Southern, Buffalo Div.**	...	80	172,564	1,938.39	38	45.00	23.65		4.35	7.58	0.32		5.87	18.15	2.85	5.69			
Erie Div.**	...	113	210,308	1,861.37	60	30.24			3.61	7.16	0.29		5.75	16.62	2.51	5.43			
Toledo Div.**	...	85	138,830	1,633.90	63	19.54			4.56	9.45	0.37		5.85	20.25	2.92	4.08			
Mich. Southern Div.**	...	308	374,235	1,802.41	40	33.18			5.75	9.46	0.25		5.87	19.03	2.63	4.63			
Little Rock & Fort Smith.	...	10	17,600	1,700	...	75.30	18.2		0.98	2.74	0.33		5.56	9.59		2.00			
Little Rock, Miss. River & Tex.	...	100	4	6,543	1,636	83,000	14.00		5.40	2.50	0.40	2.20	3.50	19.00		2.25			
Louisv'e & Nash., First Div.**	...	332	97,954	2,047.34	75	39.46	11.95		4.09	5.78	0.36	1.59	7.03	18.85	1.93	2.51			
Second Div.**	...	200	72,488	2,047.31	75	11.28			6.87	5.73	0.47	1.84	6.11	21.02	1.77	2.73			
Memph. Div.**	...	131	40,263	2,047.34	60	14.02			4.64	8.26	0.46	1.75	6.25	21.36	2.78	2.80			
Nashville & Decatur Div.**	...	122	36,667	2,047.38	25	13.98			3.69	6.84	0.36	1.70	6.15	19.14	2.65	3.00			
S. & N. Alabama R. R.**	...	183	53,588	2,047.35	25	12.96			5.01	6.65	0.65	1.51	6.03	18.52	2.94	2.00			
Marq., Hought' & Ontonagon	...	88	16,304	713.41	30	30.80	33.40		1.30	10.07	0.59		6.02	17.98	4.00				
Northern Central, Elmira & Canandaigua Divs.	...	147	40	72,035	1,801	30.35	21.74		6.49	5.47	0.61		5.67	18.24	1.60	2.00			
Penn., New York Div.*	...	120	115	276,859	2,407.36	21	11.55		4.80	8.50	1.00		14.30	3.00	4.72				
Amboy Div.*	...	154	40	72,866	1,822	58.82	19.69		5.00	5.20	0.60		9.80	3.00	4.73				
Belvidere Div.*	...	103	34	58,422	1,571	38.96	15.72		4.90	7.90	0.70		14.50	3.00	4.73				
Philadelphia Div.*	...	191	165	407,006	2,467	27.09	14.08		2.70	4.70	0.70		8.10	1.20	2.72				
Middle Div.*	...	132	63	289,918	3,116	33.01	18.32		3.90	5.80	0.50		8.20	1.20	2.72				
Little Rock & Fort Smith.	...	321	182	446,585	2,454	27.50	12.89		4.80	5.60	0.60		9.90	1.20	2.72				
Tyrone Div.*	...	107	25	53,679	2,227	24.10	24.46		4.80	5.00	0.50		14.30	1.20	2.72				
West Penn. Div.*	...	104	23	42,363	1,842	41.10	33.33		4.20	3.10	0.30		7.60	1.20	2.72				
Lewistown Div.*	...	56	7	8,889	1,270	39.44	21.65		5.30	3.10	0.40		8.80	1.20	2.74				
Bedford Div.*	...	57	4	8,974	2,244	29.93	26.04		1.70	3.60	0.50		5.80	1.20	2.72				
Pitts., Fort Wayne & Chicago, Eastern Div.*	...	371	151	367,603	2,435	44.50	18.38	15.50	0.865	2.37	3.43	0.55	4.42	6.17	13.94	1.53	1.53		
Western Div.*	...	280	90	277,738	2,802	37.70	16.75	24.10	0.597	3.25	4.06	0.41	3.09	5.93	16.74	1.53	1.53		
Pitts. & St. Louis, Little Miami Div.*	...	197	39	94,374	2,420	44.45	12.00	16.24	0.872	4.34	4.94	0.56	1.92	5.55	17.31	2.10	2.00		
P. C. & St. L. Div.*	...	224	88	244,877	2,783	30.51	22.00	19.50	0.700	5.63	2.99	0.42	2.22	5.50	16.85	2.85	2.35		
St. Louis, Iron Mt. & So., Arkansas Div.	...	325	32	75,500	2,358	...	40.20	16.40		3.98	4.58	0.46		6.10	15.12		2.53		
St. Louis & San Francisco	...	328	...	61,687	40.00	...	14.50			3.60	5.33	0.33		6.10	15.36	2.15	1.80		
St. Louis & S. E., St. L. Div.	...	208	...	47,005	38.20	...	21.90			3.58	2.19	0.27		5.77	11.61	1.92	2.72		
Nashville Div.	...	145	...	46,065	47.30	...	12.89			4.98	3.22	0.30		6.93	13.16	0.70			
Steele & Copperopolis	...	40	...	3,919	1,308	34.38	17.57			10.99	18.22	0.74	0.73	8.92	29.60	6.00	5.75		
West Jersey*	...	128	16	36,914	2,307	51.13	23.92			4.80	7.50	0.40		...	12.70	3.80	3.97		
Year ending June 30:																			
Nashville, Chattanooga & St. Louis	...	349	...	1,678,045	31.00	31.00				3.37	6.00	0.32	0.40	6.23	16.52	1.85	1.75		